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ABSTRACT

Grades, persistence, and academic learning have traditionally been criteria for college success. However, as a result of the increased interest during the last decade in exploring the use of nonintellective variables for academic prediction, nonintellective instruments for this purpose have been developed that are more refined than those previously available. These dual concerns, with academic and nonacademic success in college, have led to the development of two publications, this monograph being the first. It is the result of a project on college success inaugurated in 1967 to develop an annotated bibliography on "nonintellective factors related to success in college." The primary purpose of the present monograph is to give the reader an overview of the research that has been done and to stimulate thought concerning college academic success. All types of issues are raised, commonly held assumptions are called into question, creative and unique approaches to research on college students are demonstrated. In addition to raising questions and to providing some new insights about college students and college effects, this monograph is intended to provide comprehensive source lists for each predictor area through extensive, albeit nonannotated, bibliographies. (Author/PC)

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NONINTELLECTIVE CORRELATES OF GRADES, PERSISTENCE, AND ACADEMIC LEARNING IN COLLEGE: THE PUBLISHED LITERATURE THROUGH THE DECADE OF THE SIXTIES

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O.T.L.

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Chapter 1

INTRODUCTION AND OVERVIEW

Grades, persistence, and academic learning have traditionally been criteria for college success. Over the years, thousands of research studies have related intellective factors (such as aptitude tests, achievement tests, and high school grades) to these indices. In the late fifties, there developed an increasing interest in trying to improve prediction of academic success even further by adding nonintellective predictors such as personality traits, interests, values, and biographical data. This interest was heightened appreciably by the pioneering work of such people as Anastasi and Bloom. The prevailing attitude remains today, however, that the inclusion of such nonintellective factors as predictors cannot appreciably improve on the predictive accuracy obtained with the intellective factors. Similarly, although "motivation" is acknowledged to be significantly related to intellective college success, quantifiable, useful, and satisfactory measures of this vague and diverse variable have remained elusive.

As a result of the increased interest during the last decade in exploring the use of nonintellective variables for academic prediction, nonintellective instruments for this purpose have been developed that are more refined than those previously available. Furthermore, just as the interest in nonacademic predictors has increased, so has the interest in nonacademic criteria of college success. College officials are realizing more now than ever that to base their selection of students on only intellective factors often results in bypassing many talented students potentially capable of contributing much to the campus. In addition, research has shown that college grades are generally unrelated to later adult success.[1]

These dual concerns, with academic and nonacademic success in college have led to the concurrent development of two publications. This monograph is the first and smaller of the two. A second volume dealing with nonacademic criteria of college success entitled *The Many Faces of College Success and Their Nonintellective Correlates: The Published Literature* is forthcoming.

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[1] See Donald P. Hoyt. *The relationship between college grades and adult achievement: A review of the literature*. ACT Research Report No. 7 (Iowa City, Iowa: The American College Testing Program, 1966).

The Development of the Monograph

This monograph is the result of a project on college success inaugurated in 1967 by Commission IX of the American College Personnel Association. At that time the commission was entitled *Commission on Testing and Prediction of Academic Success*, but the name of the commission has since been changed to *Commission on Assessment for Student Development*. The name change reflects not only the change in the tenor of the times but also the developing focus of the college success project.

The commission, which was at that time under the chairmanship of Phelon J. Malouf of the University of Utah, asked one of its members, Leo A. Munday of The American College Testing Program, to initiate development of an annotated bibliography on "nonintellective factors related to success in college." Dr. Munday and his research assistant at that time, who is the senior author of this monograph, developed a plan of action; and the project commenced in the fall of 1967.

Although it was assumed that the commission had been thinking strictly in terms of grades and persistence as criteria, it was felt that other types of college success were just as important and should also be explored. The commission agreed with this, so the initial phase of the project involved searching the *Psychological Abstracts* back ten years, through 1957. References to research articles dealing with nonintellective predictors and observed to have criterion variables that someone might consider as being "college success" were entered along with descriptive information onto specially prepared "journal article evaluation sheets." Over 2,000 references were identified, after which the sheets were sorted into criterion categories and then into subcategories. Therefore, the categories and subcategories for the classification of college success were, in a manner of speaking, empirically derived.

Once some college success categories and the foci of the study had been ascertained, a thorough search of the literature was initiated. Searches were made of the various indexes and published books of abstracts in education, student personnel work, psychology, sociology, and medicine. Searches were also made of library card indexes, of *Books in Print*, and of references listed at the end of books and journal articles. Further references were found by paging through tables of contents and pages of volume after volume of journals available in the libraries of The University of Iowa and of The American College Testing Program. Interestingly, this latter method brought to light some of the most unique and creative studies that were found.

For references found, the following were to be summarized on the evaluation sheet: (a) the problem and goals of the study, (b) description and size of the sample, (c) instruments used, (d) research procedures, (e) unique features of the study, (f) criticisms of the study, (g) rating of overall impression of quality, and (h) results and conclusions. This information was used later to further refine the college success classifications initially derived and to select the studies to be annotated.

A large number of references were found that dealt with nonintellective predictors of grades and persistence. Since many reviews of the literature were found which appeared to adequately summarize the literature in that area up to 1963 or 1964, it was decided to eliminate references for academic success which were published prior to 1963. It seems appropriate to let a listing of the various literature reviews represent the studies prior to that time. However, all references found for nonacademic criteria of college success were to be included.

As time passed, the token funds provided for the project by the American College Personnel Association became depleted; and the project was still in its initial stages. Therefore, The American College Testing Program (ACT) took over sponsorship of the study and provided funds and personnel to assure its completion.

High priority projects in the senior author's normal workload plus other professional responsibilities necessitated some long interruptions in the course of the project. In addition, the turnover in personnel working on the project created further problems of continuity and uniformity, resulting in one completion deadline after another being passed without reaching the final goal. Originally the literature review was to go only through 1967. Because of the long delays, however, it was decided that the review should cover the published literature through to the end of the decade. The end of 1969 seemed a natural breaking point from which some future review could begin.

As mentioned previously, several hundred references found concerning academic success were later deleted from consideration because they had been published prior to 1963. A large number of other references were deleted for various reasons, many being judged as inappropriate for inclusion. Others were unpublished papers which probably cannot be readily obtained by readers of this monograph and were thus excluded. The thinking was that the publications included should be available to be really useful and that the most important studies for which papers are read at conventions and other meetings would usually be reported in journals or other publications at a later date. Because of size considerations, it was also decided to limit the listings only to published literature.

The original intention was to provide *one* comprehensive and wide-ranging source book for persons interested in college success and its development.

At a late date, however, it was decided to separate the materials into two different monographs, one dealing with academic criteria of college success and the other with nonacademic criteria of college success. The reasons for this decision were (a) that a single publication would be too large for a monograph and (b) that a number of people are primarily interested in only one of these two broad areas and not in the other.

The Purposes of the Monograph

Great care was taken to make the literature coverage as complete as humanly possible. However, although the attempt was made to be comprehensive, this was *not* the primary purpose of the study. With the extreme breadth and complexity of the subject matter under focus, the volume of literature available, and the changeovers in personnel working on the project, some important contributions in the literature were undoubtedly overlooked or misplaced along the way.

Concerning the selected annotations, it should be kept in mind that the purpose was *not* always to point out noteworthy quality. Some studies judged by the authors to be of lower quality than others *not* annotated were annotated for reasons such as unique approach, stimulating and thought-provoking conclusions, experimentation with specific criteria or predictor measures formerly overlooked, results unlike those for other similar studies (for which there must be a reason), utilization of uncommon statistics, etc.

The primary purpose of this monograph is to give the reader a "feel" for the research that has been done and to stimulate thought concerning college academic success. Many of the studies summarized by annotations in this monograph are quite intriguing, and the reader will be truly amazed by some of them. All kinds of issues are raised, commonly held assumptions are called into question, creative and unique approaches to research on college students are demonstrated, and exciting and/or untraveled research frontiers are pointed out. Numerous topics for future research in grades, persistence, and academic learning are proposed. It is hoped that this monograph will stimulate more future research that is quality oriented, creative, and relevant to important and practical needs of students and society.

Even though some specific studies of grades and persistence continue to be tried repeatedly with invariably the same results (e.g., relating the Edwards Personal Preference Record to grades), other problems or hypotheses have received little attention, e.g., grades and persistence in remedial programs, the success of disadvantaged students and students with other handicaps, and adult and evening class student success. It seems probable that more attention should be devoted to specific programs and to students with specific characteristics, with less attention being devoted to college students in general. Differential prediction was of concern in relatively few studies.

In addition to raising questions and to providing some new insights about college students and college effects, this monograph is intended to provide comprehensive lists of sources for each predictor area. These reference lists should prove to be a valuable aid for interested persons who wish to delve further into the subject. Some of the research results are open to various interpretations, some of the studies have been replicated several times while others have never been replicated, and different studies considered in relation to one another can result in conclusions and insights not possible when the focus is on one study at a time.

By now it should be evident that educational researchers will be only one of a number of groups who should find the book useful. Interested practitioners such as college admissions officers, counselors, teaching faculty, and administrators should find it helpful; as should high school personnel such as guidance counselors and teachers dealing with college-bound students. The monograph may also be useful as a supplemental text in courses on college students, and graduate students interested in this area will find it of help in choosing a thesis topic and in planning their research designs. In addition, it is possible that some of the insights pointed out in this monograph will be of interest to undergraduate college students and to their parents.

The Organization of the Monograph

The pre-1963 references are represented by a summary and a listing of "literature reviews" in the first section of Chapter 2. The second section of that chapter gives annotations for a number of research studies since 1963 that are multifocus and deal with several different types of predictors used in studying grades, persistence, and academic learning.

Chapters 3-8 give annotations and list the post-1963 references for 17 different categories of predictors or correlates used in studies of grades, persistence, and academic learning. The last predictor category includes unique and miscellaneous predictors that have been tried. The predictor categories were grouped into chapters according to perceived similarity of the predictors. Each predictor category section contains references for all three of the intellective criteria. Since two or more types of intellectual success were often studied simultaneously in a single study, no attempt was made to separate the literature into the three different criterion categories.

Rather than going to a cross-reference system for articles assigned to more than one predictor category, multiple listings were used. This increased the length of the reference lists, but it was felt that this disadvantage was more than offset by the ease in usage that results when the reader has a complete listing of references for a given section.

Some articles in each section have predictors of that section only as a peripheral concern of the study. It was considered important to also include such articles because peripheral studies are often overlooked by researchers. Even though the study may have included the predictor of concern only as an aside, it does possibly add an additional replication to the literature on that topic. In addition, it is possible that such a peripheral study may extend the findings of other studies (that focus on the predictor) to a different population of students. One advantage of a wide-ranging multifocus review of literature like this is the increased probability that such peripheral studies (which give no hint of the topic in their titles) will be found.

It was decided to try to annotate about ten articles for each predictor category. Although the average is about ten, several sections have a few more than ten and a couple of others have less than ten, depending on the judged noteworthiness of the articles in those sections.

Chapter 2

CORRELATES OF PERSISTENCE, GRADES, AND ACADEMIC LEARNING: A SELECTED RESEARCH OVERVIEW

Persistence, grades, and academic learning are three criteria of college success which can be subsumed under the term "academic achievement." "Persistence" involves three major categories of students: persisters, voluntary dropouts from college, and involuntary dropouts from college. The "grades" criterion can involve six different categories or combinations thereof: high grades, average grades, low grades, overachievers, par achievers, and underachievers. The "academic learning" criterion, on the other hand, is more difficult to define.

Some would define "academic learning" as the amount of knowledge gained. This definition could involve scores on a classroom subject-matter test or a standardized achievement test emphasizing knowledge of information. It could also involve the learning of principles and their applications to new situations, such as emphasized by the examinations of many college instructors and in standardized tests such as the Graduate Record Examination, the American College Tests, and the Scholastic Aptitude Tests. Others would define "academic learning" as the internationalization of thinking methods or procedures, principles, and generalizations for practical applications in the students' everyday life and after graduation. Learning facts would not be important according to people who hold this viewpoint.

There are people who more or less equate grades and learning, but such a notion is definitely improper. Learning may very well be an important factor in the grades a student receives, but "learning" and "grades" are not one and the same thing. For some students there is undoubtedly *no* relationship between grades and the amount of learning that has occurred.

Of the many different nonintellective variables that have been related to the criteria of academic achievement, some have related positively to one or more of the criteria (some with a high relationship and some with a low relationship), some have related negatively (some with a high relationship and some with a low relationship), and some have exhibited no relationship. For many variables the results have been mixed and contradictory; and there are undoubtedly interactions with other variables. (Many studies made no attempt to control for any confounding variables.)

Studies and theories about such relationships have the purpose of helping us understand the causes of the different kinds of academic achievement. Another goal of such studies and theories is to eventually arrive at a prediction system. A number of the studies attempted to predict and did explore the prediction of academic achievement. Prediction is the highest aim of any science in that an accurate prediction confirms a sound analysis, and predictions have important practical applications. But prediction is not the same as prophecy, which literally means to look into the future "as far as the eye can see." The major difference between the two processes is that the former is generally based on a body of empirical evidence while the latter is not.

A large number of reviews of literature were found for "academic success." Although a number of these reviews were published between 1963 and 1970, only those studies published prior to 1963 or 1964 seemed to be adequately covered, overall. Therefore, the first section of this chapter summarizes and lists all of these reviews of literature; and all pre-1963 published references were deleted from the monograph. The focus of almost all of the literature reviews was exclusively on grades and/or persistence as criteria.

The second section of this chapter includes some selected annotations for multifocus studies. They were multifocus in that they explored variables from more than one of the correlate-predictor categories. Rather than placing the annotations in one of those sections, it was decided to have a separate section for such annotations; and was deemed appropriate to include them in this chapter as a sample of studies from 1963 to 1970. Thus, while the first section of the chapter especially represents the pre-1963 literature, the second section represents the literature for the remainder of the decade which is detailed in subsequent chapters.

Summaries of Relevant Published Reviews Covering the Literature through 1963

This section briefly summarizes the reviews of the literature on the relationship of nonintellective variables to academic success and draws some general conclusions based on the evidence presented in the review. The various correlates and predictor types are discussed in the same order as they appear in Chapter 3-9 so there will be some continuity between this section and the presentations in those succeeding chapters.

Personality and Adjustment

In general, objective personality inventories were not found to be predictive of grades. Some studies yielded positive results, but most did not check to see if the results led to improved predictability over that of aptitude tests and high school grades. Most of those studies yielding positive results obtained them with average-ability students, and some studies found this positive prediction limited to males. Astin's study (1964) is an exception in that he concluded from his review of the literature that personality inventories might be useful for grade prediction of high-ability students. Some studies suggested that personality inventories are more useful for the differential prediction of grades than for absolute prediction.

Of the well-known objective personality inventories, the California Personality Inventory appeared to have the most validity. Especially poor results were obtained with the Edwards Personal Preference Schedule. Scores on personality inventories of all kinds seemed to be related more to persistence in college than to grades. A large percentage of students withdrawing from college dropped out for reasons other than low grades: lack of adjustment, inability to get along with others, personal problems, marriage, etc.

According to one or more reviewers personality variables that seemed to hold the greatest promise for usefulness in predicting grades and persistence were maturity in outlook (personal and social maturity); ability to conform to the group; amount of introvertedness; lack of conflict over independence-dependence; amount of independence; impulse control or ego function (responsibility, goodness, conscience, lack of hostility, and self-assurance); and overall adjustment. All of these variables had positive relationships with persistence or grades in various studies. Several studies also reported that neuroticism was related to academic performance according to Tuel and Wursten (1965).

Except for the variables previously described, there seemed to be *no* consistent pattern of personality traits that differentiated persistence and achievement from withdrawal and underachievement. Individual studies with certain localized groups obtained other specific results, but these results did *not* seem applicable to the population as a whole. However, it did seem possible that such personality variables must be related to academic success for specified subpopulations of the general population. It was also concluded that confounding variables (personality or otherwise) may have concealed some relationships for the general population.

There were *no* consistent findings noted of a relationship between projective personality techniques (excluding need-achievement scales) and grades. Projective personality instruments do *not* appear to hold much promise for the prediction of grades and persistence.

Stress and Anxiety

The degree to which a student is able to handle his anxiety was found to be positively related to level of achievement and to persistence. The mature student has learned to control his anxieties and worries so they do not seriously impede achievement.

Depending on the amount, anxiety may affect achievement in either direction. Anxiety generally has positive effects up to a point (that point depending on the person), but beyond this point it becomes detrimental.

Manifest anxiety was not found to be directly related to college success; however, it was useful as a control when combined with other variables.

Free-floating anxiety is characteristic of failure. Anxiety produced by failure is likely to produce more failure and eventually withdrawal.

Motivation, Aspiration, and Need for Achievement

It was apparent that effort and motivation are definitely related to college achievement and attrition. This relationship was purported to be one reason that achievement in high school is the best overall predictor of achievement in college. The reviewers also concluded that a lack of motivation is a plausible explanation for the difference in college achievement between rural and urban youth. Lack of motivation is probably the major reason for a large percentage of college dropouts.

Need for achievement generally correlated positively with grades.[2] However, need for achievement was directly related to academic achievement for some people and negatively related to achievement for others. Findings with projective techniques were found to be especially inconsistent.

The presence of need for achievement does not necessarily mean there is motivation to learn. Because of this fact, some achievement-need scales correlate more highly with grades than do others. In the latter case there may need to be achievement in nonacademic areas. In such a case, energy spent studying could very well be directed toward other goals. Need for achievement could then be useful in grade and persistence prediction as a control variable. There may even be a motivation for failure.

The relationship between academic aspiration and academic achievement seemed unclear. For many students academic aspiration is undoubtedly related to achievement, but some students merely wish to persist with average grades until graduation. In addition, many students hold unrealistic aspirations. (In general, women have been found to hold more realistic aspirations than men.) Aspiration may be more useful for prediction of persistence than for grades.

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[2] H. A. Murray and his associates (*Explorations in Personality*. New York: Oxford University Press, 1938) first used the term "n ach," meaning need for achievement, achievement need, or need-achievement.

Attitudes, Values, and Needs

There seemed to be general agreement that attitudes and values are closely related to achievement and persistence. However, the values and attitudes must cause the individual to see learning as a means to an end or as an end in itself in order for achievement to occur. The same is true of achievement needs. "Middle class" attitudes, e.g., a well-developed middle class time orientation and a well-developed middle class value orientation, seemed to be conducive to academic achievement and to persistence. There appeared to be no clear system of personal goals and values that was characteristic of failure.

Academic Habits and Study Methods

Study habits and methods are positively related to academic achievement. Time-orientation studies indicated that overachievers are able to plan and organize according to distant goals. This was one of the significant differences found between successful and underachieving students and between underachieving students and failing students. Poor study habits were found to be a major characteristic of college dropouts.

Interests

Although Harris (1940) was very pessimistic in his evaluation of interest inventories as predictors, some later reviewers were quite optimistic. For example, Durflinger (1943), in a review published only three years later, wrote that "interest yields a higher relationship with college success than any other personality trait and appears to be a remarkably stable function [p. 75]." Schroeder and Sledge (1966) concluded that there is an "overwhelmingly positive" relationship between interests and achievement. Some measures of interest had been found to correlate with college performance almost as well as measures of aptitude. On the other hand, Fishman and Pasanella (1960) noted that seven interest-inventory studies published in the late fifties yielded correlations with GPA ranging from only .05 to .26.

Considering the discrepancies noted above, probably the most realistic observation was made by Lavin (1965) when he stated that interests are not related to grades in professional curricula because enrollment in such a curriculum presupposes high interest in that area. In nonspecialized curricula, however, Lavin suggested that interest measures are useful for predicting performance in parallel course areas. And Lavin concluded thus about interests in general: "On the basis of those studies that control adequately for ability, measures of interest, both in terms of content and in terms of more abstract characteristics, are useful in predicting academic performance [p. 74]." He further said that this is especially true for males and also that interests may be related to other variables that are correlated with grades.

A finding of the review by Stein (1963) should also be mentioned. His review indicated that noncompulsive students are more predictable using interest inventories than are compulsive students. Stein concluded that this points out "that a major issue is to determine what kinds of students are predictable with what kinds of techniques under what kinds of circumstances [p. 57]."

Extracurricular Activities

Reviews indicated that extracurricular activities (including work) do not seem to inhibit and may assist academic success if the activity is not concentrated to any great extent. Overconcentration on an out-of-class activity, however, can interfere with academic progress. In interpreting these findings, one should keep in mind that seemingly few, if any, of the studies reviewed controlled for aptitudes.

Sexton's (1965) review of the literature indicated that poor students do not participate in activities to any great extent and usually are not leaders. She also found that concentrated interest in dramatics, music, and athletics is characteristic of dropouts and that interest in cultural clubs, departmental clubs, and school publications is characteristic of academically successful students. Concerning activities scales, Michael and Boyer (1965) reported that significant relationships had been found between academic performance and the needs scale profiles of the Activities Index.

Self-Concept

The quality of self-concept was found to consistently differentiate among successful, underachieving, and failing students. Self-depreciation is consistently a characteristic of failing students. There appears to be a reciprocal relationship between self-concept and academic achievement. It was generally agreed that self-worth and self-concept aid academic achievement (self-assurance is important for academic success) which in turn aids self-concept. Because of this reciprocal effect and other confounding variables, however, self-concept scales would seem to have a limited usefulness in *predicting* achievement.

An additional conclusion was that lack of achievement does not necessarily imply poor self-concept. It is also worth noting Di Vesta's (1961) finding that the relationship between self-attitudes and over- and under-achievement seems to differ according to the curriculum and the college atmosphere.

Ratings of Others

The ratings of principals, teachers, peers, and significant others appear to have some validity on the basis of Fishman and Pasanella's (1960) report. They found nine studies that used ratings or interviews, and correlations with grades ranged from .26 to .77. However, most of the ratings were counselors' predictions of grades. There were a number of studies reported which involved rating of adjustment, popularity, and study habits; but few studies of overall academic ratings and raters' prediction of grades were noted, with those being almost entirely concerned with ratings by counselors.

Interpersonal Relations

There were consistent findings of positive interpersonal and social relationship with grades and persistence. Acceptance by peers (the number and type of friends) is positively related to academic achievement. A major characteristic of failure is disparagement by others.

Application Blanks and Biographical Questionnaires

Most reviews failed to mention application blanks and biographical inventories as such. Fishman and Pasanella (1960) reviewed 23 studies and found correlations of biographical data with grades ranging from .01 to .63 with a median of .13. Studies since their review have indicated that certain types of biographical data have promise as predictors of academic achievement and persistence.

Concerning persistence, Summerskill (1962) concluded that age and sex do *not* differentiate dropouts from persistors. However, older students may encounter more obstacles to production; and women tend to withdraw for different reasons than men, e.g., marriage.

Parental Characteristics and Family Relations

The educational level of parents is positively related to academic achievement and persistence. Parents' views toward life goals and education definitely affect the life goals and education of their children. Sexton (1965) noted that a student's level of aspiration depends largely on his parents. The successful student is more likely to have parents who show warmth and interest and who give him a relatively strong role in decision making. It was also reported (Schroeder and Sledge, 1966) that positive sibling as well as parental relationships were related to achievement. Tuel (1966) concluded that dropouts are more likely to come from unstable homes (homes broken by death, divorce, or separation, and homes typified by financial insecurity).

Schroeder and Sledge (1966) reported that as far as family size is concerned, a large number of siblings and an absence of siblings were negatively related to college achievement. An exception would be those who can be classified as an only child.

The "only child" was found (Stein, 1963) to have a significantly higher GPA during the first semester in college than did children in other family-size categories. In another study reviewed by Stein, *no* relationship was found between number of children in a family and grades.

In a review of graduate-student achievement, Stuit, Dickson and Jordan (1949) indicated that family and parental characteristics are *not* a very important factor in determining success in graduate school. All of the other reviews were concerned with undergraduates.

Socioeconomic Level

Most research has shown socioeconomic level to be positively related to grades. However, there are several significant exceptions in which negative relationships were found. Di Vesta (1961) suggested mobility as a plausible explanation for negative findings. Lavin (1965) concluded that these contradictory findings were the result of only upperclass students from Eastern prestige schools being included in some studies. He hypothesized that there is a positive relationship between socioeconomic level and grades through most of the socioeconomic range, but that it is an inverse relationship for upper-level students. Such reasoning could also explain why public high school graduates generally achieve higher in comparison with ability than do private high school graduates (as outlined in the next section).

It was generally agreed that lower socioeconomic-level students are more likely to drop out. Both socioeconomic level and sociocultural factors are important as far as persistence is concerned.

High School and Geographic Factors

Public high school graduates were found to generally earn better grades in relation to aptitude than do private high school graduates. Cotter (1964) indicated that the attitudes and personality of high school teachers often affect learning and achievement. Cotter also concluded that failures often result from high schools not meeting individual differences and needs, especially for impoverished and deprived students.

There have been contradictions in the literature as to the effect of high school size and accreditation on college grades and persistence. Schroeder and Sledge (1966) noted in their review that there were no significant relationships between accreditation, high school size, and grades. But Sexton (1965) concluded in her review that high school size and accreditation are related to first-year college grades. Most of the reviews indicated no definite trend about the effect of accreditation and high school size on persistence and grades.

Concerning geographic factors, geographic region and urban-rural background were considered to be related to academic performance in college (with intelligence controlled). Rural youths tended to be more disadvantaged in achievement opportunities, exposure to scholastic values and goals, achievement motivation, and high school preparation.

College Environmental Factors

It is evident that different students perform differently in different types of colleges. For example, an excessively controlled and rigid student would generally not do well in a college environment that is opposed to rigidity and conventionality (Stein, 1963). Many general environmental characteristics might be hypothesized as being related to grades and persistence. However, the reviews of literature gave little or *no* empirical evidence about the validity of such hypotheses about the general college environment. Some of the reviews did cover specific environment in the classroom and teaching procedures, however.

The mechanics of learning have posed an especially serious problem at all levels of education. Most of the research on learning outcomes has attempted to explain the appreciable variance that remains unaccounted for after the effects of variables such as ability, teaching, and prior learning have been removed. As a result, *Jackson and Strattner* (1964) pointed out that research in this area tends to center around two interrelated hypothesis: (a) learning effectiveness is inhibited by various forms of psychological pathology, membership in a socially deprived group or a stressful family environment, and/or by classroom conditions that create a threatening climate; (b) learning effectiveness is enhanced by possessing certain psychological traits (positive attitude toward school, realistic achievement goals, etc.).

Concerning teaching techniques, Householder (1968) reviewed studies which explored teaching problems in vocational, technical, and practical arts education. Many of these studies compared closed-circuit television and programmed instruction with traditional lecture and textbook methods. In general, few if any significant differences in cognitive achievement were found. For example, one study had found closed-circuit television, lectures, and student-directed study to be equally effective in terms of initial learning. The "TV" group had higher retention-test scores after four weeks but these differences were not significant after seven weeks of the experiment.

McKeachie (1962b) when reviewing studies of general college undergraduates, found evidence to support the superiority of lectures for information mastery and of discussion for achieving higher level learning objectives. If traditional achievement tests are used as a criterion, then large lectures generally were not inferior to small lectures as far as class size is concerned. It was also found that discussions tended to stimulate more active thinking than lectures, but there had been no adequate follow-up to see in what ways active thinking relates to gains in long-term knowledge or cognitive skills. Research on classes where both lecturing and discussion were used suggests that such combinations may have utility.

It is interesting to note that scores on final exams generally appeared to be little affected by teaching method. A single principle in the classroom which was *clearly* supported by the research on college testing, however, is that the knowledge of results facilitates learning, and that the sooner such feedback is given, the better. Research did strongly suggest that student behavior outside the classroom situation may be influenced in the direction of stated educational goals through student-centered teaching. In addition, McKeachie indicated that research supports the contention that student-centered teaching is effective in producing noncognitive changes.

The results of a later reviewer, Ryan (1969), substantiated McKeachie's (1962b) conclusions about lecture versus discussion. If the objective is for students to develop concepts or skills in critical thinking then a straight lecture method is not the best one to use. The research indicates that students prefer lecture with some discussion or all discussion to straight lecture, but student achievement is not correlated positively with preference in teaching method.

Schramm (1962) found that demonstration courses in certain areas such as science are more favorably received on TV, than courses that depend primarily on verbalizations or student practice. Evidence tended to support the contention that about as much learning takes place in a TV classroom as in a traditional one. Schramm concluded, "The question is no longer whether a person can effectively teach on TV, but rather how, when, for what subjects, and with what articulation into classroom activities can instructional TV be most effectively utilized [p. 165]."

Considering the early date, Schramm's position is rather strong, but apparently shared by other reviewers in educational media. Wendt (1962) argued that current research indicated that, in some instances, films could assume the total teaching load. Zinn (1967) found evidence supporting the position that computers could help bridge the gap between contrived laboratory situations and actual applications of learning principles in the classroom. Computers could make primary sources of knowledge more accessible to students through organized files of information, procedures, and associated learning tools. In the long run, this might actually give students more control over the learning environment.

Given the possibility that the computer can simultaneously analyze and adapt teaching sequences to the learning abilities of each person, Filep (1967) felt that this can assure true compatibility for the individual and education. If one of the stated educational objectives is for students to respond more actively to an instructional device, then a computer probably can provide a broader learning experience than most mass communication media, but there are problems.

Gentile (1967) cited the cost of computer assisted instruction (CAI) as being prohibitive for all uses except research. Other obstacles were also noted, e.g., as the negative attitude many teachers have about CAI and the rush to mechanize education prematurely.

Lesser and Schueler (1966) were quite skeptical of research applying new media to traditional teacher education programs. They criticized most of the research on the grounds that it was discrete, atheoretical and failed to contribute to a cumulative analysis of the role of media in the teacher preparation process.

Denemark (1967) also cited the need for more research in areas of teacher role differentiation and the use of new media in teacher education programs.

It is often difficult to deal with learner characteristics in research. Briggs (1968) contended that the exceptions must be taken into account. Just as one medium cannot be shown to be the best for a given subject area, research also cannot demonstrate that one medium is best for a particular type of student. Briggs indicated that there are instances when students with low verbal ability learned better by reading than by constructed response programs.

The quality of research is uneven and very little can be said about how social factors operate on the student and influence learning. It is also very difficult to define effective teaching. Boocock (1966) indicated that satisfying group relations are not related to learning in any direct or consistent way. On the other hand, many students will not push themselves to achieve unless it is consistent with peer group norms.

Gayles (1966) concluded that the literature is based primarily on opinion, description of practices, recommendations of committees, etc.; and very little on definitive research. A scientific method has never been utilized to study college teaching. Furthermore, Gayles, who was especially critical of research on instructional methods, argued that in most studies the procedures are not adequately defined, studies are not carefully controlled, and evaluation is often carelessly done.

Bellack and Huebner (1960) also contended that recent modes of inquiry into teaching have not been fruitful and that we must consider the fact that teaching has its own forms, constituent elements, problems, and regularities. Teaching also takes place under a stable set of conditions. More research is needed in order to move from empirical data to an evaluation of concepts.

Research in this area of techniques and modes of instruction definitely needs to be related to basic research on learning. As Householder (1968) indicated, many researchers have limited themselves to specific teaching-learning problems without considering the implications of their research in conjunction with related research in other areas. The problem is still one of delimiting the variables involved in the learning process; and whether one opts the discovery process or the expository process, certain questions remain unanswered. There still is a great need to clarify the interacting variables involved in the learning process, and the hope was expressed that future research in this area will address itself to this problem.

In general, the reviews on teaching also indicates a great need for some semblance of a theoretical base from which working models can be developed. Observations in the classroom need to be integrated and conceptualized, thus allowing for testable hypotheses. Birney and McKeachie (1955) gave a good summation of the state of affairs which still exists today regarding research in teaching by concluding that, "With more adequate theory, increased empirical background, and improved measurement tools, the researcher of the next decade can walk where previous research in teaching has slowly crept [p. 66]." Will we ever reach that "next decade" to which Birney and McKeachie referred?

Counseling and Special Programs

Callis' (1963) early review of research on counseling was quite optimistic. He felt that a considerable amount of progress had been made in clarifying the domain and goal of counseling and in developing theories to explain the process. It is ironic that this optimism was not shared by subsequent reviews of the literature on counseling.

Kagan (1966) found evidence supporting the conclusion that certain unspecified group procedures utilized by some counselors with some clients in certain settings and at certain times will result in change in the clients GPA, attitude, behavior, etc. Unfortunately, these conclusions are quite general and could easily be attributed to chance as Hosford and Briskin (1969) point out.

For the most part, the reviewers of research on counseling appeared to be in agreement concerning basic problems in research. There has been a general lack of a theoretical basis for the research, in addition to a lack of concrete goals and theories to explain the counseling process. The relationship between treatments and outcomes appears to be very questionable.

Another problem that Anderson (1969) mentioned was the lack of specific procedures and techniques in sufficient detail to permit replication. His review was limited to group counseling, but it did indicate the lack of a theoretical body of related knowledge on which counseling in general can be solidly grounded. Optimal group size is another problem, but little research has been done on the effects of group size on specific process or outcome variables.

Perhaps the strongest criticism of counseling comes from Hosford and Briskin's (1969) suggestion that it may be hard to refute Stefflre's (1963) contention that counselors might learn more about helping students from reading *Catcher in the Rye* than from reading counseling journals. They pointed out the existence of a huge gap between theoretical rationale, outcome criteria, and practices. They set up a laboratory field dichotomy which had very little overlap. Laboratory research often did not yield workable techniques for practitioners, and field research often left a person hanging by leaving him ignorant of both theoretical assumptions and specific results.

Island (1969) indicated that research on counseling students with special social or emotional problems is scattered and unbalanced. Certain problems received little attention (e.g., difference or effects of poverty or affluence), and some problems were totally ignored (e.g., nonconformity, apathy, and alienation).

Research on counseling Blacks in public schools is starting to appear in the literature. For example, Gilliland provided small-group counseling to adolescent Blacks and found that it significantly increased their test scores and GPA.

B. F. Gilliland, "Small group counseling with Negro adolescents in a public high school," *Journal of Counseling Psychology* 15 (1968), 147-152.

Concerning the lack of positive findings of research on counseling, Rothney and Farwell (1960) cited the problems in securing adequate criteria, amassing longitudinal data, and devising suitable research designs. However, a summary finding by Carkhuff (1966) may account in even larger part for a lack of positive findings. Studies in the literature have not differentiated between good and poor counselors. It may be that the good counselor in a sample facilitates progress while the poor counselor in the same sample is retarding progress.

Concerning the effects on academic success of other kinds of special programs, the reviewers seemingly ignored them. Counseling was the only special program receiving attention in literature and research reviews.

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Selected Annotations of Post-1963 Multifocus Studies

Some of the studies explored various predictors of academic success and are included in the reference lists for more than one predictor category. A certain number of the multifocus studies were selected to be annotated, and annotations for eleven of these studies constitute this section of the monograph. Since approximately ten annotations were to be included for each predictor category, it was arbitrarily decided to have eleven multifocus annotations. These eleven annotations follow.

Using correlational and chi-square analysis on data from an entrance questionnaire, the California Psychological Inventory, and the Inventory of Beliefs, *Astin* (1964a) studied personal and environmental factors associated with college dropouts among 6,660 high-aptitude students (4,472 men and 2,188 women). He found that students who dropped out of college came from lower socioeconomic backgrounds, had lower high school rank, planned initially to complete less college, and applied for relatively fewer scholarships. Personality measures showed the dropouts to be more aloof, self-centered, impulsive, and assertive. An analysis of effects of 15 college characteristics was performed using 38 input variables as control data. This analysis found no significant college effects on the tendency for men to drop out, but for women the chances of dropping out increased when they attended colleges with high proportions of men in the student body.

In a separate study, *Astin* (1964b) compared the 334 students who had received 1961 Merit Scholarships with the remaining 127,212 students at 248 colleges. The Scholars tended to have more ambitious educational plans, had more extracurricular (especially creative) accomplishments, and came from higher socioeconomic backgrounds. They were less likely to be interested in "school teaching," business, or the professions, and tended toward careers as professors and researchers. Comparisons between samples of subjects matched on sex, high school class size, father's level of education, and father's occupation indicated that the aforementioned differences between the Merit Scholars and Nonscholars in aspirations and achievements could not be accounted for by socioeconomic level.

Blanton and Peck (1964) related 44 predictor variables on a variety of instruments to first-semester GPA for three achievement-level groups of 124 freshman women at the University of Texas. Multiple-regression analyses revealed that 11 measures of academic aptitude and achievement correlated .85 with first-semester grades, ten biographical items related to activity patterns correlated .81 with first-semester grades, six self-motivational description ratings correlated .73 with first-semester grades, and four attitudinal descriptions correlated .56 with first-semester grades.

Since the cognitive variables accounted for 74% of the GPA variance and are more readily obtainable, the authors concluded that a battery of aptitude and achievement tests remained the most efficient and economical procedures for mass screening of college students. Even though the addition of the nonintellective variables meant that 88% of the variation in grades was accounted for, they did not believe the gathering of such data was worth the time and expense involved.

Brown and DuBois (1964) hypothesized that a minimum amount of scholastic aptitude is necessary for academic success within a particular curricular major, but that above this minimum, success is determined more by nonintellectual variables. They further hypothesized that different nonintellectual characteristics are rewarded in different curricula of a college or university. To test these hypotheses, they compared the cumulative GPAs for 76 high-ability men in the College of Science and Humanities with those for 125 high-ability men in the College of Engineering at Iowa State University to see if different factors predicted academic success for the two curricular areas. Predictors included biographical data, study habits and attitudes, and personality characteristics.

After using multiple-regression analysis to predict GPAs for each group, it was determined that the successful engineers were more hard working, energetic, conforming, and efficient than the successful arts and science students. The successful arts and science students were more oriented to the philosophy and goals of education and were more flexible.

Holland and Nichols (1964) attempted to predict academic and extracurricular achievement in college for a random sample of 1,000 National Merit Finalists (50% males and 50% females) by assessing a variety of interests, activities, goals, personality traits, and self-conceptions. End-of-freshman-year grade point averages constituted the academic achievement criterion. Multiple-regression equations were developed for each criterion using the Wherry-Doolittle variable selection procedure. Out of the 130 variables studied, only those resulting in a significant ($P < .01$) reduction in residual variance were retained for the equation. The regression equations were then cross-validated on another sample of 376 boys and 61 girls.

The prediction and cross-validation multiple correlations with GPA, respectively, were .44 and .24 for males and .47 and .40 for females. Results showed that records of past achievement and the Potential Achievement Scales developed from everyday activities and interests were generally superior, as predictors, to other kinds of variables and equalled them in efficiency. Expressed goals, such as grades a student expects to receive in college, were next best in predictive efficiency. Of special interest was the fact that Scholastic Aptitude Test — Verbal and Mathematics failed to enter the GPA multiple-regression equation at this high level of aptitude.

Kerr and McCaa (1964) attempted to differentiate 91 successful and unsuccesful University of Iowa students readmitted on scholastic probation. One group of these students was required to raise its cumulative GPA to 2.0 while the other group had to earn only a 2.0 GPA for that term. No differences were found between the successful and unsuccessful readmitted students on the basis of general academic aptitude, nor did the measure of academic aptitude used (Iowa College Scholarship and Placement Test Battery) serve as a predictor of academic success or failure. Furthermore, setting a higher minimum acceptable achievement level for readmitted students did not result in achievement which was any greater than that of readmitted students required to achieve at the same level as regular students.

The students in both groups also completed a 28-item questionnaire which gathered the following types of data: (1) historical or background factors affecting the student prior to college entrance, (2) motivational and social-perceptual factors operating while the student was in college, and (3) emotional and attitudinal reactions of the student to his college experience. Chi-square and *t*-test analyses of the questionnaire data revealed that "successful readmitted students were more easily distinguished from the unsuccesful on motivational, attitudinal, and social-perceptual factors related to adequate interpersonal adjustment than on the basis of educational and home background factors." Eight of the questionnaire items revealed statistically significant group differences ($P < .10$), and seven of the other items were considered to be worth noting because of trends that were "consistently congruent with the pattern of the significant differences."

Long (1964) studied sex differences in academic prediction based on scholastic, personality, and interest factors. His sample included 113 freshman women and 303 freshman men at the Norfolk College of William and Mary. Using multiple-regression analysis, college GPA was predicted using high school average, scores on the School and College Ability Test, and 27 variables from the Diagnostic Reading Test, the English Training Test, the Kuder Preference Record, and the Guilford-Zimmerman Temperament Survey.

It was found that the pattern of predictor variables selected by the stepwise multiple-regression program was quite different for men and women in both academic and nonacademic factors. For example, the verbal was more important for women and quantitative more important for men on academic variables. Differences in patterns on nonacademic variables seemed due mainly to level and type of motivational experience, level of maturity attained, and types of courses chosen. Personality factors seemed more important for men and interest factors more important for women. Both the nonacademic and the academic patterns indicated that academic prediction should be improved by attempting to predict success based on intended curriculum.

Panos and Astin (1968) studied the attrition of college students in a four-year longitudinal study involving 30,506 students at 246 colleges by examining the relationship of a variety of student characteristics to dropping out of college. Linear multiple-regression analysis and analysis of covariance were the statistical methods utilized. With such a large sample size, statistical power is such that some of the differences noted may not have much practical significance even though they were statistically significant.

It was found that students who dropped out came from lower socioeconomic backgrounds; had lower grades in high school; had a lower level of initial educational aspiration; and tended as entering college freshmen to declare business, engineering, or secretarial work as probable career occupations. The findings also suggested that students are more likely to complete a four-year program if they attend colleges where student-peer relationships are characterized by cohesiveness, cooperativeness, and independence; where the students frequently participate in college activities; where there is a high level of personal involvement with and concern for the individual student; and where the administration's policies concerning student aggression are relatively permissive.

Using high school records and five different questionnaires administered over a five-year period, *Schroeder and Sledge* (1966) attempted to determine the relationship between selected background factors and college academic success for 181 male high school graduates from five Wisconsin counties who attended college for a minimum of one year. It was believed that these students were representative of most Wisconsin high school graduates at that time who attended college for a minimum of one year. A second purpose of the study was to predict college grades and to determine the relative contribution of each factor to prediction. Ordered factors were normalized (by converting them to stanine scores) and entered into a multiple-regression equation. Analysis of variance was used to relate the unordered factors to the course-area and cumulative GPAs.

It was found that the 26 background and motivational characteristics studied accounted for about 40% of the college overall GPA variance. The course-area GPA percentages of variance accounted for were as follows: pure science — 33%, social science — 30%, technical — 27%, language — 24%, and mathematics — 19%. Family factors (parental education, family size, sibling sex ratio, father's occupation, etc.) did not seem to be as useful for prediction as did choice of occupation, field of interest, and other motivational characteristics. Another finding was that the relation of high school grades to college grades varied with the course being studied, e.g., no relationship was found for technical and agricultural courses, while other courses had fairly high relationships.

Smith (1965) used in-depth interview data to identify significant psycho-social differences between achievers and nonachievers. Out of a group of 154 male freshmen at the University of Kentucky who scored in the top 5% on the College Qualification Tests, 62 had failed to receive a 2.00 grade point average for the first semester or the second semester. Sixty-seven interview items were formulated for the following psycho-social areas: (1) socioeconomic background, (2) high school background, (3) attitudes toward authority, (4) personal needs and aspirations, (5) academic adjustment, (6) peer culture, and (7) satisfaction with their university experience. Chi-square analysis revealed statistically significant differences ($P < .01$) between the two groups for 25 of the 67 interview items.

Smith found that achievers tended to come from communities of 50,000 to 100,000 population, were more religious, and tended to be Protestants. (Most of the nonachievers came from metropolitan areas of 600,000 population and over.) They were from high schools with enrollments of 900 to 1200, did better in high school, had good study habits, and did not feel pressed by their parents to achieve high grades. They were concerned with cultural aspirations and service to humanity rather than status, money, or the "good life." They had more hobbies and perceived fewer personal problems. They were satisfied with their academic major and the university they chose and believed that grades were important. No differences were found between the groups on parent's professional background or financial status.

Trent and Medsker (1968), as a part of their extended longitudinal study of 10,000 college students across the country, found that a number of factors differentiated the college-withdrawal group from the college-persisting group. One major factor was socioeconomic level, with students withdrawing tending to be from lower socioeconomic levels. Persisters also had more motivation to attend college and to graduate, were more selective in choosing their colleges and saw more reasons for attending, studied harder and did not let social life interfere with their studies, were more flexible, were more intellectually oriented, and were more self-reliant and open minded. Although both groups had an equally complex outlook on life at the start, persisters' outlooks increased in complexity during college while withdrawals moved toward a more simple outlook.

The authors also concluded from their data that family climate was of critical importance for persistence in college. Persisters saw their parents as more interested in their children's achievements and more willing to praise. They saw their parents as more intellectual, ambitious, active, and orderly.

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Chapter 3

PERSONALITY, ADJUSTMENT, AND ANXIETY CORRELATES OF ACADEMIC ACHIEVEMENT

This chapter reviews studies that have explored personality, adjustment, stress, and anxiety as correlates of grades, persistence, and academic learning. The first section will focus on the first two predictor factors, and the second section will deal with stress and anxiety.

Personality, adjustment, and anxiety factors are universally judged to be important in whether a student succeeds academically, especially when success is defined as persistence and grades. However, many different definitions of personality exist. Furthermore, personality is such a complex variable that good observable and quantifiable measures of this concept, which can add significantly to the prediction of academic success, have been elusive. (The same is true of adjustment.) The personality inventory most commonly used in research on grades and persistence during the past decade has been the California Psychological Inventory, which was devised for typical students rather than for use with psychologically disturbed individuals (for whom the Minnesota Multiphasic Personality Inventory is commonly used). Another instrument designed for typical students, which has been used extensively, is the Omnibus Personality Inventory.

Although the effects of stress and anxiety certainly depend on the student personality type involved and on the student's adjustment, these variables lend themselves to experimental studies. Definitions of anxiety are easy to operationalize, and stress can readily be induced without students realizing that the situation is *not* genuine. Consequently, the effects of stress and anxiety continue to be investigated extensively.

The pervasive effects of anxiety can be disastrous for a student. More pressure is put on students every year in the form of entrance exams, course exams, and graduate school exams. Pressures to remain in school because of factors such as the war in Viet Nam or the tight job market have been extreme. Research in this area has led to the development of specific models of anxiety or stress, e.g., Atkinson's risk-taking model. Several formal therapeutic models ranging from psychoanalysis to systematic desensitization have also come out of research in this area.

Personality and Adjustment

Personality and Adjustment as Correlates of Grades, Persistence, and Academic Learning: Selected Annotations

Barger and Hall (1964) attempted to clarify the role of personality differences in academic achievement relative to ability. The sample included 916 dropouts and 2,744 students who completed one year at the University of Florida, and the Minnesota Multiphasic Personality Inventory (MMPI) was the personality instrument used. The nondropouts were divided into high- and low-achievement groups. Correlations of School and College Ability Test (SCAT) scores and grade point averages (GPAs) were compared for those groups having different MMPI scales as high points.

For both men and women, students with high points on the Psychopathic deviate (Pd) and hypomania (Ma) scales received lower grades and dropped out more frequently. Males with a high point on the masculinity-femininity (Mf) scale and females with a high point on the hysteria (Hy) scale had a better record of achievement and a lower dropout ratio. In addition, students with high points on the depression (D) or the Mf scale had higher correlations between GPA and ability test scores than would have been expected if the MMPI patterns had not been considered.

Chansky (1965) analyzed the relationship of high school achievement, Scholastic Aptitude Test (SAT) scores, and certain Rorschach attributes to freshman grades in six different curricular areas. His sample included 151 engineering majors, 47 agriculture majors, 96 physical science and mathematics majors, 71 forestry majors, 74 education majors, and 46 textile majors. Only 8 out of 90 Rorschach zero-order correlations with GPA were statistically significant: human figure perception and anxiety for agricultural students; poor form perception and anxiety for education students; animal movement perceptions and anxiety for textile majors; and animal figure perception and human figure perception for physical science and mathematics majors. None of the Rorschach correlations were statistically significant for engineering majors and for forestry majors.

Cope (1968) selected seven scales of the Omnibus Personality Inventory (OPI) which seemed most relevant to a liberal arts education, and these were taken by all incoming 1962 and 1963 freshmen at the University of Michigan College of Literary Science and the Arts. These scales had previously been shown to have good reliability and were generally uncorrelated with measures of academic ability. Two years later the OPI scores of students who had dropped out ($N=565$) were compared with the scores of a randomly selected group of persisters ($N=730$).

Only Religious Liberalism scores differentiated the two groups of men, with the dropouts tending to have a more conservative religious orientation than did the persisters. For females, Estheticism and Theoretical Orientation were the only scales with scores clearly related to dropping out. There was also an indication (although not statistically significant) for both men and women that students with higher scores on Social Maturity may have a better chance to persist.

Since the California Psychological Inventory (CPI) had given positive results when predicting grades in other settings, *Gough* (1964) used it to predict success in medical school. First, he compared students who were admitted and later graduated with those not admitted using the CPI and the Medical College Admission Test (MCAT). The t-test of differences between the means was significant only for CPI Socialization ($P < .01$) level and MCAT Quantitative ($P < .05$).

Using 34 students at the University of California School of Medicine, Gough developed four-variable CPI and four-variable MCAT multiple-regression equations, separately for each of the following six criteria: first-year GPA, second-year GPA, third-year GPA, fourth-year GPA, cumulative GPA, and faculty ratings. The CPI equation for GPA ranged from .50 for first-year GPA to .57 for third-year GPA while the MCAT equations ranged from .28 for first-year GPA to .06 for third-year GPA. In predicting faculty ratings, the CPI correlation of .66 compared with a MCAT correlation of —.18. Such CPI characteristics as personal maturity, consideration for others, and self-confidence were important in medical school rather than the CPI factors found to be important for other academic settings (e.g., need for achievement). When the CPI equation for predicting faculty rating was used with a cross-validation sample at the University of Colorado School of Medicine ($N=63$), a correlation of .46 was obtained.

Heilbrun (1965a) studied Adjective Check List (ACL) personality factors relating to dropping out of college in a sample of 2,149 students, an entire freshman class, at the University of Iowa. After the first year, groups of dropouts and nondropouts were identified and were matched on ability scores. Personality differences were studied at three ability levels and for the sexes separately. Results for both sexes but only at the high ability level supported the hypothesis that dropouts would be more assertive and less task oriented.

Himelstein (1965) used The American College Test (ACT) Composite Scores and seven of the eleven Minnesota Multiphasic Personality Inventory (MMPI) academic prediction scales formerly listed by Kleinmuntz[1] to predict college GPA. His sample consisted of 193 freshmen in an introductory psychology course at New Mexico State University. Six of the MMPI scales yielded significant correlations with GPA. However, the correlations between the MMPI scores and ACT scores were generally even higher, suggesting that noncognitive predictors of college performance may not be independent of intellectual factors and may in reality be indirect measures of intelligence.

Lunneborg and Lunneborg (1967) used new techniques of pattern analysis in predicting GPAs of 121 students in an introductory psychology class from Edwards Personal Preference Schedule (EPPS) scores. Scale scores were trichotomized to limit the number of patterns. Of the five scales chosen, multiple-regression analysis showed that the Intraception scale had the highest correlation with GPA, .20 for males and .26 for females. Multiple correlations (adjusted for expected cross-sample shrinkage) for women were .57 and .50, respectively, when Achievement and Abasement patterns entered into the equation, and they were .42 and .40 for men. However, subpattern scoring did not aid prediction in another sample of 600 students who were clients drawn at random from the files of the university counseling center.

Miller and O'Connor (1969) used the Achiever Personality Scale (Ach P) of the Opinion, Attitude, and Interest Survey (OAIS) as a predictor of GPA in two studies of disadvantaged students (Opportunity Award Students) at the University of Michigan. Freshman GPA and eligibility to continue as upperclassmen were the criteria for both studies. Study 1 involved the 129 students matriculating in 1964, while Study 2 involved using the same procedures for the 90 students enrolling in 1966. For both samples, 85% of the students were Black.

Neither high school rank (HSR) nor Scholastic Aptitude Test (SAT) scores correlated significantly with either criterion for men. Ach P correlated significantly with both criteria only for those men scoring low on SAT. The findings suggested the possibility that SAT and Ach P interact so that each is a valid predictor only for those men who score low on the other predictor. For women, SAT but not HSR correlated significantly with freshman GPA, while neither SAT nor HSR correlated with upperclass eligibility. Ach P correlated significantly with both criteria of success for low as well as for high SAT women.

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[1] B. Kleinmuntz, "Annotated bibliography of MMPI research among college populations," *Journal of Counseling Psychology* 9 (1962), 373-396.

In an investigation of 1,454 men who dropped out of Harvard, *Nicholi* (1967) found from health service records that the incidence of psychiatric disorder was four times higher among the dropouts than among the general undergraduate population. About 38% of the dropouts suffered emotional disorders severe enough to cause them to seek medical help. Therefore, it would appear that psychiatric disorder was an important cause of dropping out of Harvard.

Dropouts with a diagnosis of character disorder were the least likely to graduate from Harvard; while those with a diagnosis of transient situational personality disorder were the most likely to graduate. For secondary diagnostic categories, those with obsessive-compulsive disorders and those with sexual deviation disorders were the most likely to graduate, while those diagnosed manic-depressive were the least likely to graduate. Schizophrenics had the lowest rate of return to school after dropout, but they had the highest rate of persisting once they did return.

The psychiatric dropout group was considerably more intelligent than the nonpsychiatric dropout group. This characteristic of high academic aptitude held for all diagnostic categories except the psychoses.

A high incidence of depression was noted, and this was judged to be the primary causal factor in the decision to leave college. The depression was the result of disparity between the ideal self (viewed as a uniquely gifted achiever) and the real self (viewed as one of thousands of students struggling in a competitive and threatening environment), and it is this discrepancy that accounts for the discrepancy between academic potential and academic performance.

Nichols (1966) developed scales for predicting first-year college grades and extracurricular achievement for 1,013 National Merit finalists by item analysis from four item pools: the California Psychological Inventory (CPI), the Vocational Preference Inventory (VPI), the Adjective Check List (ACL), and the Objective Behavior Inventory (OBI). The scales were cross-validated using a sample of 317 National Merit finalists and a sample of 419 students of average ability. No special separation of the sexes was made, and grades were not adjusted for college selectivity because a pilot study revealed that the variance between colleges chosen by the sample was not great. It was found that the CPI and the OBI items had higher validities (phi coefficients) than items from the ACL and the VPI. The nonintellective scales significantly added to prediction of GPA over that obtained by high school rank (HSR) and Scholastic Aptitude Test (SAT) scores. The best predictor of college grades was HSR followed by the nonintellective scales and finally by SAT scores.

In a study of 48 first-year undergraduate premedical, arts and science, and prelaw students at Queens University in Canada, *Payne, Davidson, and Sloane* (1966) attempted to predict academic success using a battery of cognitive and personality tests. The students were paid volunteers and retook the tests at the end of their third year. Correlations were computed between the variables and the final examination marks for the year. The only personality measure correlating significantly with final marks was the measure of the tendency not to repress incompleted tasks, the Zeigarnik effect. Students with highest marks tended to be unable to repress incompleted tasks although their recollection of completed tasks was not a relevant factor as suggested by the nonsignificant correlation between final marks and the number of completed tasks recalled.

The most striking finding was that the abilities which were related to university success seemed to change over the two years. Thus, none of the measures that had correlated significantly with end-of-first-year examination marks were significantly correlated with the final examination marks at the end of the third year. However, third-year performance was significantly correlated with a measure of persistence and a stressed speed score (which had not been predictive of first-year examination performance).

Suinn (1966) studied personality characteristics (Guilford-Zimmerman Temperament Survey) and grades of 184 private liberal arts college students of different grade levels. Scholastic Aptitude Test scores and high school GPAs were included in the grade prediction formula, which controlled for differences in scholastic aptitude. For every group of students, separate analyses were done for each sex.

GPA significantly correlated with seriousness for freshmen, juniors, and all students combined. Significant correlations with friendliness were obtained for sophomores, seniors, and all students combined. Results indicated that seriousness and the degree to which a student performed better than predicted were significantly related. Thus, students described as serious or as showing restraint tended to achieve higher grades than expected of them from their high school record and aptitude test scores.

Taylor and Farquhar (1966) used edited and rescaled personality items extracted from previous studies to predict GPA and to see if groups of underachievers and overachievers could be differentiated among 4,200 eleventh grade students from nine high schools in eight Michigan cities. All analyses were done separately for each sex.

The items were tried out on a small sample of students and then combined into a 94-item instrument called The Human Trait Inventory (HTI). Each item was analyzed by the chi-square model, with alpha set at the .20 level (2-tailed) for validation and at the .10 level (1-tailed) for cross-validation purposes. The 2-tailed validation analysis yielded 48 male and 53 female items. Of these 32 male and 31 female items, which correlated .42 for males and .36 for females with GPA, cross-validated at the .10 level. These items significantly increased the precision of prediction of GPA over that of an aptitude predictor (Differential Aptitude Test for Verbal Reasoning) at the .01 level, although the increase was slight (from .62 to .68 for men and .60 to .63 for women).

Wyer, Weatherley, and Terrell (1965) related aggression and social roles ascribed to males and females to academic achievement on a sample of 45 male and 48 female students. Siegal's Manifest Hostility Scale was used to measure aggression, with subscale scores measuring tendencies to acts of aggression, feelings of aggression, and absence of guilt over aggression. Several *t* tests revealed that among males, those both high in direct aggressive expression and low in guilt over aggression had the highest academic effectiveness. Females both low in direct aggressive expression and high in guilt over aggressive expression had the highest academic effectiveness.

Zagona and Kelly (1967) studied the use of ego strength and related personality variables as mediating factors between scholastic aptitude and scholastic achievement. The Taylor Manifest Anxiety Scale and Barrow's Ego Strength Scale were administered to the 35 highest and the 35 lowest scorers on the Rokeach Dogmatism Scale from a group of 515 students in an elementary psychology class. A 2-tailed test of significance found that no relationship existed between ego strength and dogmatism. High achievers had significantly lower ego strength scores.

Personality and Adjustment as Correlates of Grades, Persistence, and Academic Learning: Bibliography of Published Literature

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Stress and Anxiety

Stress and Anxiety as Correlates of Grades, Persistence, and Academic Learning: Selected Annotations

Bronzaft (1968) hypothesized that the relationship between test anxiety and academic performance would be greater for socially mobile college men than for socially stable men. To test this hypothesis, he utilized 840 male students enrolled in an introductory psychology course at three New York and New Jersey colleges (which appear to be quite different in nature). Social mobility was operationally defined as "the difference between the ratings, on a socioeconomic scale, of the educational and occupational goals of a student and the ratings of the educational and occupational levels of his father." The measures of test anxiety were the Alport-Haber Achievement Anxiety Test and the Hayes Test Attitude Questionnaire. Psychology course examination grades comprised the criterion for academic performance.

Statistically significant negative correlations ($P < .01$) were found between test anxiety and performance for the socially mobile group at each college. None of the socially stable groups were found to have a statistically significant correlation between test anxiety and performance. The hypothesis was confirmed although the significant correlations were only in the .20's.

Carlson and Ryan (1969) administered the Test Anxiety, General Anxiety, and Need for Achievement sections of Sarason's Autobiographical Survey to 234 students in upper-division Education and Western Civilization courses at the University of California, Riverside. Students were randomly divided into four groups, each of which took one portion of a multiple choice science test corresponding to a particular level of cognitive functioning as defined by *Bloom's Taxonomy of Educational Objectives Handbook*. The levels are (a) Knowledge, (b) Comprehension, (c) Application, and (d) Analysis. Test anxiety and general anxiety were negatively related to Knowledge and Comprehension scores, but they were unrelated to Application and Analysis scores. When the study was repeated using 329 high school students (a less intelligent as well as a younger group), once again there was a negative relationship between test anxiety and Comprehension scores. However, test anxiety was unrelated to Knowledge scores for this group.

Carrier and Jewell (1966) studied the extent to which academic examination performance could be predicted from several measures of academic achievement anxiety (Alport and Haber's Achievement Anxiety Test, the Anxiety Differential, and Sarason's Test Anxiety Scale). To attain the most efficient predictive utility from the shortest amount of testing time, interaction effects between selected anxiety measures were determined, expressed as cross products, and included as independent variables in each multiple-regression equation. The dependent variable was the score on a final examination in introductory psychology. The authors' data supported the contention that scores on self-report measures of anxiety can be useful in predicting academic examination performance. They found, however, that the prediction of examination performance was better for female than for male students.

Desiderato and Koskinen (1969) failed in an attempt to confirm, for college women at different ability levels, Speilberger's (1962) finding that high scores on the Taylor Manifest Scale result in lower GPAs for men. A total of 94 freshman women were selected using the upper and lower 20% of the distribution on the Heineman forced-choice anxiety scale. At the end of the first semester a scale measuring specific anxiety (the Achievement Anxiety Test which gives scores for debilitating and for facilitating anxiety), a need-achievement scale, and the Brown Holtzman Survey of Study Habits and Attitudes were administered. Analysis of variance was used to determine the various effects of anxiety on GPA and study habits.

The findings for women were that general anxiety had no significant effect on GPA (no matter what the ability level), that specific facilitative anxiety is associated with higher GPA while specific debilitating anxiety is assocated with lower GPA, and that differences in specific anxiety are related to differences in study habits which are in turn related to GPA. The results recommended the use of specific anxiety scales rather than general anxiety scales for the prediction of academic success and suggested the possibility that poor study habits which affect grades may in part result from specific anxiety.

A group of 210 male freshmen at a liberal arts, nonresident college was divided by *Malnig* (1964) into High Anxious (HA), Middle Anxious (MA), and Low Anxious (LA) groups using the Taylor Manifest Anxiety Scale. The School and College Ability Tests (SCAT) were administered to the entire sample under stress conditions. For each subgroup of students, the zero-order correlation (r) between GPA and each SCAT score was computed. In order to determine the reliability of the differences among the various correlations, the r's were converted to Z coefficients and critical ratios calculated for comparison purposes.

The groups did not differ significantly on SCAT and GPA means, but they did when the correlation critical ratios were examined. The LA and MA groups had significantly higher correlations with GPA for SCAT Quantitative (Q) and for SCAT Total. For SCAT Verbal (V), the LA group was the only one which had a correlation with GPA that was significantly different from zero, although it was not significantly different from that of either of the other groups. The V score was the best predictor of grades for the HA group while the Total score was the best predictor of grades for the MA and LA groups. The author concluded from his data that the concept of "differential predictability" holds promise for future research.

Mukherjee (1969) hypothesized that a certain condition must be met before there will be a statistically significant academic grade difference between High-Anxious and Low-Anxious (as defined by scores on Taylor's Manifest Anxiety Scale) student groups. This condition is that the ability and self-image for the two groups must be equalized.

Mukherjee used analysis of variance with multiple covariance adjustment (MANOCOVA) to test the hypothesis on 86 students in an introductory psychology class at an Indiana University branch campus. Control variables were five tests from Thurstone's Primary Mental Abilities (PMA) plus the Self Insight Test (a test of self-esteem). It turned out that the two groups were also matched (accidentally) on PMA Vocabulary Test, age, and need for achievement. The analysis clearly indicated the difference between the two anxiety groups on the psychology course exams, but the difference became statistically significant beyond the .01 level only when the dependent variable was adjusted for the control variables. However, follow-up multiple-regression analyses revealed that adding the MAS as a predictor to the already used PMA Vocabulary and Gestalt Transformation Tests did not significantly improve predictive efficiency.

Oetting (1966) related examination anxiety to scholastic performance on a sample of male college freshmen from the University of Alberta. The anxious students were chosen on the basis of their Minnesota Multiphasic Personality Inventory (MMPI) patterns. Correlations between the anxious and nonanxious students (who had been selected using random methods) indicated that they do respond differently to test situations. The prediction of college grades from the test results was not as good for the anxious group as it was for the control group. However, it was noted that for some people in the anxious group, anxiety may have interfered with the test taking but not with overall scholastic performance. For these people, anxiety about performance in general may lead to more study, effort, and preparation which compensates for their test anxiety problem. Another discovery (noted when pulse, respiration, and skin resistance were observed during the experiment) was that stress occurs primarily before the examination for some anxious students and during the examination for others.

Pervin (1967) used Alport-Haber Achievement Anxiety Test (AAT) and Scholastic Aptitude Test (SAT) scores to study the moderating effects of anxiety on the relationship between aptitude and performance and the moderating effects of aptitude on the relationship between anxiety and performance for college freshmen. The sample consisted of 717 out of 820 male freshmen entering Princeton in 1964 who voluntarily completed the AAT. Statistically significant although low (on the order of .20) correlations were found between anxiety and academic performance. Anxiety was not, however, differentially related to performance for different Scholastic Aptitude Test ability levels. Nevertheless, there was an indication that aptitude predicts performance best when students are low in debilitating anxiety.

Spielberger (1966) reported the results of several laboratory and real-life experiments which explored the effects of anxiety on complex learning and academic achievement. When he investigated the relationships among anxiety, intelligence, and academic achievement, he found subjects in the mid-ability range and the high-anxiety range to be most affected by stress situations. High anxiety produced no observable effect on the performance of low-ability subjects and tended to facilitate the performance of subjects in the high-ability range.

When serial rote learning was investigated, it was found that high-anxious subjects had inferior performance compared with low-anxious subjects early in the learning process, but that the low-anxious subjects exhibited superior performance later on. Concerning the relationships between anxiety and concept formation, the performance of the high-anxiety, low-intelligence subjects was inferior to the low-anxiety, low-intelligence subjects while the performance of the high-anxiety, high-intelligence subjects was superior to that for the low-anxiety, high-intelligence subjects.

Wright (1966) studied a sample of 350 University of Florida undergraduate students using Bill's Index of Adjustment and Values and 26 Activity and Personal Stress Scale items measuring perceived environmental stress. No relationship was found between GPA and the self-concept scales for the entire sample. Yet there were significant (but opposite) correlations toward each end of the income scale.

It was concluded that students from poor families who have low self-concepts, when given the oportunity to raise their positions, will work harder to succeed the more they are threatened. This study demonstrates that failure to examine demographic factors when examining other variables may result in falsely nonindicative correlations.

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Chapter 4

MOTIVATION, ATTITUDE, AND HABIT CORRELATES OF ACADEMIC ACHIEVEMENT

High school grades have generally been found to be the best predictor of college-freshman grades. This finding is believed to result from the fact that high school grades not only give an indication of students' ability, but also of other factors which affect grades such as motivation.

Proponents of symbolic-interaction theory contend that motivation is such a vague concept that it should not be studied as such. Their view is that it is too easy to ascribe a happening to motivation when we cannot explain what caused it. They propose that we should rather focus on specific goals, objectives, and cues as causes of effect.

In spite of this admonition by the symbolic interactionists, much research in this area continues to focus on constructs such as need for achievement and achievement motivation, and on instruments that supposedly measure such constructs. The relationship between achievement motivation and grades must be qualified. In general, there seems to be some correlation, but it appears to be relative to the person. For some people measured achievement motivation is directly related to academic achievement, while for others there is a negative relationship. Achievement motivation is not a necessary condition for motivation to learn. It can imply a need to achieve in nonacademic areas. It can also imply high anxiety and fear, where the crucial factor is whether a student can adapt his drive to a particular college situation.

The relationship between college-degree or occupational aspirations and academic achievement is somewhat unclear. It is undoubtedly related, but some people only want to persist with average grades until graduation. There is also a problem in determining the effect of unrealistic aspirations. Aspirations may be expected to be more useful for predicting persistence than for predicting grades.

A middle-class value-and-time orientation is generally considered to be especially conducive to achievement and persistence. While it is agreed that attitudes and values are important for college success, however, useful value-type instruments for predicting such success are lacking.

Poor study habits and methods are also universally acknowledged to be characteristic of college dropouts. Successful students do tend to plan and organize their studying more efficiently. The most commonly used measuring instrument for study habits, methods, and attitudes is the Brown-Holtzman Survey of Study Habits and Attitudes.

Motivation, Aspiration, and Need for Achievement

Motivation, Aspiration, and Need for Achievement as Correlates of Grades, Persistence, and Academic Learning: Selected Annotations

There were a total of 89 male students who entered a small liberal arts college in September of 1959 and later completed at least one quarter of academic work. *Abel* (1966) used these students to test the hypothesis "that a student whose statement about vocational and/or academic goals expressed certainty and whose grade point average was below 2.0 at the end of one year would probably not graduate." The author reported that 75% of the *low, uncertain* group failed to graduate while the "average of the rate of loss from other cells" was 37.1%. From this he concluded that the hypothesis was "convincingly supported." However, a percentage-of-dropout comparison directly between the *low uncertain* group and the *low certain group* was not reported. A *t* test between the *low uncertain* and *low certain* groups for end-of-first-year grade point average indicated no difference between those two groups on this variable.

Anderson (1964) developed a test of academic aspiration which utilized 49 achievement differentiating items. These items were achievement differentiating in that they had differentiated a group of over-achieving college freshmen from a group of under-achieving freshmen. The achievement groups were determined by the difference between a student's actual grade point average (GPA) and his GPA as predicted by the College Qualification Test (CQT) and high school rank. Anderson used the Test of Academic Aspiration (TAA) to predict freshman GPA for 380 students, which it did as well as did the CQT (.54), although it was fairly independent of the CQT (.20). The multiple correlation obtained using the TAA and the CQT in combination to predict grades was .70. Separate statistics were also given for men and women.

Bachman (1964) predicted academic achievement (GPA) of University of Pennsylvania sophomores using the Edwards Need Achievement Scale. His sample included only 37 students while a separate cross-validation sample included 24 students. Scholastic Aptitude Test (SAT) means and standard deviations were not reported in the study.

Bachman found no increment in the prediction of GPA when the need achievement scores were added to the SAT scores in a multiple regression equation. Neither did this scale help in predicting over-achievement and under-achievement.

Costello (1968) had found in a series of factor analytic studies that two kinds of need for achievement can be distinguished: (a) the need to do a job well through one's own efforts (own work), and (b) the need to emulate other successful people, as distinguished from hard work (emulating others). Scales for both of these kinds of need for achievement were developed and administered to 198 freshman college students. On the basis of their resulting scores, four groups of ten students each were selected: low scores on both scales, high on own work and low on emulating others, low on own work and high on emulating others, high in both scales. End-of-year examination grades were obtained for all students and group comparisons made. The rank order of examination means was as had been predicted. However, analysis of variance indicated that only the main effect of the "own work" scale was significant. It was concluded that the college examination marks were related to a need to achieve a job well done on one's own efforts and unrelated to a need to achieve in terms of the emulation of successful people.

Green and Farquhar (1965) studied the relationship between academic motivation and scholastic success in a sample of 233 Negro and 515 Caucasian 11th grade students. A theoretically based objective measure of academic motivation (the Michigan State M Scales) containing four subscales (need for achievement, academic self-concept, occupational aspirations, and academic personality factors), plus a measure of scholastic aptitude — the School and College Ability Tests (SCAT) — were used to predict GPA. The Negro male correlation between GPA and SCAT was —.01 and yet all M scales except "academic personality factors" had statistically significant positive correlations with GPA. M-total correlated .37 with GPA for Negro males. For the three other groups all correlations with GPA were significantly greater than zero. Except for Caucasian males, the M correlations with GPA were larger than the SCAT correlation with GPA. For example, the respective correlations for SCAT and M-total were: Negro female — .25, .55, Caucasian male — .62, .50, Caucasian female — .21, .43.

Since the two scales stem from different approaches toward the measurement of academic motivation, *Lindsay and Althouse* (1969) desired to compare the predictive validity of the Strong Vocational Interest Blank Academic Achievement Scale (AACH) and the College Student Questionnaire (CSQ) Motivation for Grades Scale (MG). Subjects for the study were 388 freshmen at Pennsylvania State University who had taken both the SVIB and the CSQ-1. The criterion for the study was end-of-year cumulative freshman grade point average.

Although AACH and MG were relatively independent (.16 for both sexes), and AACH appeared to be more highly correlated with Scholastic Aptitude Test (SAT) scores than was MG, MG correlated higher with GPA. This was especially true for men (.27 versus .10 for men and .29 versus .25 for women). Adding the predictors to a regression equation containing SAT and high school grade average indicated some incremental validity for MG, but none for AACH. However, the conclusion was drawn that both scales appear to have little utility for predicting freshman achievement.

Locke and Bryan (1966) studied the effects of cognitive performance standards on level of psychomotor performance. The sample included 29 male volunteers from the University of Maryland. The authors found that subjects given specific difficulty standards performed at a higher level than subjects told to "do their best." Furthermore, the standards resulted in superior performance during the entire work period, not just in the latter stages.

A grade goals questionnaire was administered by *Locke and Bryan* (1968) at the beginning of the spring semester to 326 enrolled in a course on the development of Western Civilization at the Catholic University of America. Seventy-seven percent of the subjects were freshmen. The questionnaire (which was given after an announcement that anonymity was guaranteed) asked the students for the grade in the course they hoped for (H), the grade expected (E), the grade which would be minimally satisfying (M), and the grade they were actually trying for (T). In addition, each student was asked to answer the same four questions for his hardest course, the easiest course, and his GPA for the semester.

At the end of the semester, grades were obtained for the history course, the hardest and easiest course listed by each student, and semester overall GPA. Zero-order correlations between the grade-goal measures and the obtained grades were then computed for each of the four criteria. Then the correlations (separate ones for each sex) were recomputed partialling out academic aptitude (School and College Ability Test Scores). All observed correlations were significant at the .01 level, and all but one of the partial correlations were significant at the .05 level. The E and M correlations were generally higher than the H and T correlations, but this result was probably because of the generally lower variances for the latter two variables due to ceiling effects. The finding that trying for high goals resulted in more frequent failure to reach the goals but in a higher level of performance than did trying for easier goals replicated earlier studies where task duration was only a few minutes or hours.

Pemberton (1963) made a comprehensive factor analytic study of the abilities, values, backgrounds, and achievement patterns of 334 seniors at the University of Delaware. He concluded that developed ability is *not* a purely intellectual attribute, but that it is largely determined by motivation. Furthermore, motivation was found to have a more important role in academic achievement at each higher educational level. Tests for developed ability, which predicted best for freshman grades, were replaced by motivations, the best predictor of senior year grades. Another freshman-senior difference found was that seniors are more "theoretical" and less "practical" in their approach to learning than are underclassmen.

For most programs in the curriculum, it was found that high-achieving was positively related to "academic-theoretical" orientation and under-achieving was associated with a "practical, vocational, and social" orientation. Furthermore, underachievement was associated with a lack of congruence between "expectancy" and "reality." College grades correlated well with academic conformity, satisfaction in minor field, and female sex. Also, creativity was significantly correlated with college grades, especially in the senior year.

Reed (1968) constructed a 56-item College Assessment Inventory (CAI) providing information on eight student motivational variables, and he related the items to achievement status for 1962 entering freshmen at Skidmore College. A total of 343 women, 97% of the entire class, were included in the sample. Students' perceptions of *meaningfulness of daily college tasks* correlated .22 with overachievement ($P < .001$). Scores for *field of interest*, *relevance of college to the students future goals*, and *warmth of interpersonal relations* predicted voluntary dropout; the chi-squares were significant at the .05 level. Furthermore, a choice of professional field, a high relevance of the college to future goals, and perceptions of a warm interpersonal atmosphere indicated an 82% chance of persisting and a 10% chance of voluntarily dropping out of school.

Taylor and Farquhar (1965) studied the relationship of theorized and extracted factors of personality motivation to achievement. A sample of 300

11th grade students was given the Human Traits Inventory (HTI), which had previously been shown to differentiate between under- and over-achievement. Discrepant achievers, whether they were under-achievers or over-achievers, were combined for analyses. Use of the principal axis method of factor analysis followed by quartimax rotation resulted in the identification of six interpretable male factors and five female factors. Results suggested that the extracted male factors related to five of the theorized factors (academic anxiety, activity patterns, goal orientation, authority relations, and self value), and that the extracted female factors related to four of the theorized factors (academic anxiety, activity patterns, authority relations, and interpersonal relations).

Warwick (1964) utilized 736 male fraternity pledges and 427 male independents (who were freshman dormitory students at Cornell University) to explore the relationships of group cohesiveness and scholastic aspiration to first and second semester academic achievement. Scores on a group cohesiveness questionnaire developed by Worell constituted predictors for the study. A sign test utilizing z-scores resulted in evidence that a strong relationship existed between low cohesiveness and improvement in grade point average from the first to second semester. On the other hand, a weak but consistent relationship existed between high cohesiveness and lack of improvement in grades and between favorable aspiration and scholastic improvement. However, when second semester grades were adjusted for first semester GPA level and comparisons between groups on adjusted second semester GPA were made, using analysis of covariance, all group differences were found to be statistically nonsignificant.

Weiner (1965) explored a modification of Atkinson's 1957 model for achievement-oriented behavior which says "resultant motivation persists following nonattainment of a goal." Sixty introductory psychology course students at the University of Michigan, who had taken the Thematic Apperception Test (TAT) and the Mandler-Sarason Test Anxiety Questionnaire (TAQ) and who scored in the upper or lower 25% on a combined z-score distribution resultant achievement motivation, constituted the sample for the experiment. The subjects were given an achievement-related activity to perform knowing they could move on, whenever they so desired, to a non-achievement-related activity. Two achievement conditions were created: (a) a success condition where the subject was told 70% of the college students had been completing the task in the allotted time period and where he was allowed to finish and (b) a failure condition where the subject was told only 30% of the college students had been completing the task in the allocated time and where he was interrupted before completing the task. Nonparametric statistics — Fisher Exact Test and the Mann-Whitney U Test — were used to explore differences between the groups under different conditions and sequences.

The results indicated that students high in resultant achievement motivation persisted longer and worked with greater speed following failure than following success. Conversely, students low in resultant achievement motivation persisted longer and worked with greater speed following success than following failure. These results supported the proposed modification to Atkinson's model.

As part of a pilot study, *Zissis* (1964) interviewed 400 Purdue University freshmen women in order to place them into one of five categories based on career and marriage plans: career primarily, tend toward career, career-marriage, tend toward marriage, and marriage primarily. Then the groups were compared with one another on GPAs, interview data, scores on the Strong Vocational Interest Blank, and scores on the Interpersonal Adjective Check List using t tests and chi-square analysis.

Scholastic achievement did not significantly discriminate among the five groups. Motivation for high grades was characteristic for all of the groups, not only for the career-oriented groups. The author concluded that the drive "to do a good job" is stronger at this stage of development for women than is the marriage and/or career drive. Interestingly, the majority of women wanted both a marriage and a separate career.

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Attitudes, Values, and Needs

Attitudes, Values, and Needs as Correlates of Grades, Persistence and Academic Learning: Selected Annotations

Need patterns were related with School and College Ability Test (SCAT) scores for 508 University of Florida freshman dropouts and survivors (319 men and 189 women) in a study by *Chambers, Barger and Lieberman* (1965). The dropout and survivor groups were matched in size for each sex. Picture Identification Test (PIT) measures of need attitudes, judgments, and associations, and student self-ratings of anticipated grades and study efforts were explored using discriminant function analysis.

For both sexes, the analysis (D^2) discriminated dropouts from survivors beyond the .0001 level. Two-thirds or more of the dropouts and of the survivors were correctly classified for each sex. Again for both sexes, SCAT Verbal and SCAT Quantitive contributed the most to D^2: two-thirds of the total contributions, versus one-third for the combined PIT measures. The self-rating measures did not appear among the top ten discriminators for either sex.

A high score on attitude toward need for aggression was associated with dropout for both men and women. However, the sexes were opposite with regard to scores on attitude toward need for affiliation, with high positive attitude scores indicating survival for women but dropout for men. These were the only two variables among the highest ten contributors to D^2 which were common to both sexes.

According to the PIT discriminators for men, dropouts tend to be more aggressive, sociable, resistant to authority and controls, and less well adjusted sexually than do survivors. They do not like to assume leadership responsibilities, find it difficult to resist requests or demands of others, tend not to perceive requirements and demands made on them by their circumstances, and let their feelings become involved with their judgments. Women dropouts, on the other hand, tend to be antisocial (even in a clear-cut situation that calls for being friendly), aggressive, anti-authority and anti-discipline, and lacking judgment.

Cole and Miller (1967) studied the relevance of expressed values on semantic-differential-type bipolar scales to the prediction of academic performance (GPA) using a sample of 233 Colorado State University freshmen. The scales used had previously shown high factor loadings on "the evaluative dimension of meaning" and involved reacting to the concepts of academic achievement, Colorado State University, counseling, and social life.

Regression analysis indicated that these value scales contributed significantly to the prediction of GPA, over and above the contribution made by the Scholastic Aptitude Tests (SAT), for both males and females. Of the value scales, only "value placed on academic achievement" made a significant unique contribution to GPA for women, and its contribution was much less than either SAT variable. For the male group a significant relationship with GPA was also observed for the value placed on the university.

Both this value and the value placed on academic achievement added to prediction of GPA over and above the largest individual contributions made by SAT-Verbal and SAT-Mathematics.

Ellish (1969) attempted to investigate students' attitudes toward the school they were attending and their initial academic preference at that school. Using Thurstone's equal-appearing-intervals method, two attitude scales were developed. One scale attempted to measure attitude toward the junior college, and the other scale attempted to measure attitude toward the 4-year college. The two scales were administered to 1,450 high school seniors.

More than 450 of the responding students had completed at least 12 units of course work in a California higher education institution. From this original sample, two groups of students were selected and matched by sex, high school grade point average, standard test results, and father's occupation. The smaller groups included 75 junior college students and 75 4-year college students, respectively.

There was a correlation for both groups between students' attitude toward the school they were attending and academic preference. It thus appeared that the more extreme the attitude, the greater its potential effect on achievement. Furhermore, students entering junior colleges, although having equal secondary school GPAs, had less favorable attitudes toward the collegiate institutions than did comparable 4-year college students, and they did *not* perform as well in college as their 4-year college counterparts did.

An earlier study had suggested important relationships between college achievement and two attitudinal variables: authoritarian attitudes and ethnocentric attitudes. Therefore, *Garms and Ray* (1968) attempted to replicate the earlier findings and to examine more closely the relationship of such attitudes to achievement.

Several attitude scales of the Edwards Personal Preference Schedule (EPPS) and the California Psychological Inventory (CPI) were administered in booklet form to 147 introductory psychology students. An intercorrelation matrix was developed which included correlations among all attitude scales (the predicters) and two criteria (end-of-course grade and cumulative GPA), and it was subjected to varimax factor analysis procedures.

The authoritarian and ethnocentrism scores correlated negatively with psychology grades and cumulative GPA. Factor analysis revealed about the same factors whether psychology grades or cumulative GPA were used as the criterion: ethnocentric attitudes, democratic attitudes, authority conflict, and identification with authority.

Grande and Simons (1967) used the Mann-Whitney *U* Test to explore differences in personal values between a group of 20 sophomore engineering students on academic probation and another group of 20 who were on the dean's list. The two groups were not matched on aptitude, however, and there was almost a significant group difference (a *U* value of 125 was obtained while 27 was needed for significance at the .05 level) for Scholastic Aptitude Test Total mean. The values which significantly differentiated the two groups (and which the authors believe may be important even if the groups do differ on aptitude) were need for achievement, direction of aspiration, peer group values, independence in planning, persistence, self-control, and high school record.

Musselman, Barger, and Chambers (1967) used the Picture Identification Test (PIT) to study male college students at the University of Florida in an attempt to understand the relationships between student needs and achievement. Using the Effectiveness Indicator (EI) of the PIT, three groups of 35 students each were formed — high EI group, low EI group, and a random group. Two and a half years later the groups were compared on grades, persistence, and disciplinary action. The high EI student did exhibit greater effectiveness. The most significant difference was for disciplinary action, a finding which suggests that the EI measures social effectiveness more directly than it measures academic effectiveness. The lower the EI, the greater the percentage of students who had exhibited behavior that resulted in disciplinary action being taken against them.

Neidt and Hedlund (1967) desired to test the hypothesis that there are certain periods during a learning experience when attitudes toward that experience are closely related to final achievement. They expected that there would be increasing congruence between attitudes and final achievement as a college course progressed through the semester.

A total of 573 students in three different courses (Anatomy, English, Composition, and first-year German) at Colorado State University comprised the samples for the study. Seven measurements were available for each student: five attitude measurements derived from five equivalent forms of a 26-item scale administered in counterbalanced order approximately every two weeks during the semester, a measure of academic ability (SAT scores for the English students, Concept Mastery Test scores for the German students, and grade average on other than anatomy courses for anatomy students), and final course grades. Partial correlations, with ability held constant, were calculated between each attitude score and final course grades. Multiple-regression analyses with the attitude scores and the ability score as predictors were also conducted.

Constantly decreasing mean attitude scores were noted for all three courses. The correlation data provided some evidence to support the hypothesis that attitudes become progressively more closely related to final achievement during the course of the semester.

Sprinthall (1964) gave the Allport-Vernon-Lindzey Study of Values to three groups of high school boys (95 underachievers, 24 par achievers, and 28 super achievers) and to 136 teachers and guidance counselors. Multiple-discriminant analysis was used to examine differences between the four groups. The groups were significantly different, with the Economic Scale providing the major source of separation. Conclusions of the study were that teachers and superior achievers are most similar in the domain of values while the underachievers and par achievers also tend to be similar in values. Furthermore, the discriminant scores classified practically no one into the par or superior achievement group, apparently because the values for these groups were "literally overshadowed by the value distributions" for the underachiever and teacher-counselor groups. The authors suggested that the much greater value conformity between teachers and superior achievers may be partly the result of biased grading. However, because of the nature of the values apparently shared, they cautioned that further research on this topic (using externally varying conditions of social status) is needed to ascertain whether the hypothesis is true.

Veldman (1968) attempted to determine the effects of sex, aptitudes and attitudes on academic achievements. The sample included freshman students at the University of Texas — 1,358 men and 957 women. The subjects completed the Brown Self-Report Inventory which attempts to measure attitude toward self, others, children, authority, work, reality, etc. The scores on these scales were intercorrelated with Scholastic Aptitude Test (SAT) Verbal and Math scores, first semester grade point averages, and the sex of the subjects. Grades were clearly related to SAT-V and SAT-Q, and also to the *work* attitude measure.

Multiple-regression analysis was used to assess the independent contribution made by each variable, in the presence of the other variables, to the prediction of GPA. The addition of the attitude variables as predictors resulted in a substantial increase in predictive efficiency, but the only scale appearing to make a meaningful individual contribution was the *attitude toward work* scale. Almost 7% of the GPA variance was explained by the addition of the *work* scale to the equation. The contributions of the *attitude toward parents* scale and the *reality* scale also were statistically significant, but they were much smaller than the contribution of the *attitude toward work* scale.

Attitudes, Values and Needs as Correlates of Grades, Persistence, and Academic Learning: Bibliography of Published Literature

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Academic Habits and Study Methods

Academic Habits and Study Methods as Correlates of Grades, Persistence, and Academic Learning: Selected Annotations

In two studies using 640 and 187 Iowa State University freshmen, respectively, *Brown* (196-) explored Brown-Holtzman Survey of Study Habits and Attitudes (SSHA) patterns and relationships. For the study he related SSHA scores to first quarter grade-point averages (GPA) and ascertained whether they made a unique contribution to prediction when included in an equation with Minnesota Scholastic Aptitude Tests (MSAT) scores and high school rank (HSR). This was done separately for Home Economics students, Science and Humanities women, and Science and Humanities men. It was found that the SSHA scores correlated positively with GPA (with correlations ranging from .18 to .29) but that they made no practical contribution to the prediction when used in combination with MSAT scores and HSR.

The second study involved students who took the SSHA twice, once at the the beginning of their college career and once after two quarters. The posttest scores predicted GPA about as well as did the pretest scores, with results for both testings being similar to the results obtained in Study 1. The second study also indicated that the students had better study habits and more positive attitudes toward school and studying when they matriculated than they did after two quarters of college experience. The college experience seemingly had a negative effect on these variables.

Caple (1969) employed matched samples of low-achieving (GPAs of less than 2.0 on a 4.0 system) students in three attempts to see if required organized study would improve GPA over that obtained for control groups that had not been involved in such activity. The study and the control groups in each case consisted of Northeastern State College (Oklahoma) students;

and the two groups were matched on American College Test Composite Scores, age, and academic load. The organized study activity had little effect for all three cases. It was concluded that motivational factors accounted for this finding.

DeSena (1964a) studied the effectiveness of two study habits inventories, the Brown-Holtzman Survey of Study Habits and Attitudes (SSHA) and the College Inventory of Academic Adjustment (CIAA), in predicting consistent over-, normal, and underachievement at Pennsylvania State University. The sample included three ability-matched groups of 42 consistent over-, normal, and underachieving male college freshmen. Both instruments showed evidence of being quite useful in identifying nonintellectual factors influencing academic achievement, as well as in discriminating among achievement-level groups of students. Overachievers tended to spend more time in study, to use sound study techniques, to make more profitable use of their time, and to be more conscientious and motivated when it came to academic work and studying. Underachievers were especially low on these factors.

Gifford and Sommer (1968) examined a unique though possibly superfluous question. They explored GPA differences between students who studied at a desk and students who studied in bed. For the group of 331 students who were interviewed in dormitories at eight different colleges and universities, almost half of them (160) studied on their beds. The two groups of students did not differ on GPA. It was concluded that a variety of study environments are needed with some students preferring one environment and other students a different study environment.

Maddox (1963) was interested in how the study practices of university students compared with the advice given in how-to-study manuals. From results of a questionnaire administered to 64 Arts and Science students at the University of Birmingham in England, he concluded that we need to know more about student work cycles and their determinants and that we should not insist on the virtues of steady plodding work for all. He found that none of these English students had a set timetable for studying. Of the 15% who kept set study hours, all of them were the poorest students. Conversely, the better students worked in cycles. They had spells of enthusiasm lasting for two or three days when they would work almost nonstop, and then there would be periods during which they avoided work completely.

Since Scholastic Aptitude Test (SAT) scores had not been very predictive at their college, *Michael, Baker and Jones* (1964) wondered if new instruments might not add to the prediction. The Carter California Study Methods Survey (CSMS) and an experimental form of the Type Indicator (TI) were given to 210 males and 177 females in the Liberal Arts College at the University of Southern California. The scales were correlated with grades, separately by sex. Not all predictors were available for all subjects so they did not use multiple-regression analysis. The four scales of the CSMS showed almost as much predictive potential as the Scholastic Aptitude Tests (SAT) and the English Classification Test (ECT). They concluded that the CSMS would add substantially to a multiple correlation including SAT and ECT.

Shatir (1967) investigated the study habits of a class of 81 first-year medical students and 4 graduate students in order to determine the relationship of their study habits to achievement in the first year of medical school. He wished to use the findings as a guide in developing methods of improving medical students' study habits and learning techniques.

A three-part study habits inventory incorporating items that worked in other studies was administered to the freshman class at midyear. When correlated with grade-point average based on all freshman basic science courses, it was found that scores on none of the inventory scales correlated significantly with GPA or with Medical College Admissions Test averages. Item analysis, however, did indicate 17 items in Part 1 of the inventory (Wrenn's Study Habits Inventory) which differentiated students in the upper GPA quartile from those in the lower GPA quartile. Qualitative analysis of Part 3 of the inventory, which consisted of open-ended responses about individual study problems, did not suggest any relationships with GPA, but it was felt these responses could be useful for student self-evaluation and in the psychoeducational counseling of underachieving students.

Waters (1964) developed a forced-choice overachievement and underachievement scale, based on student responses to a number of items pertaining to academic habits. This checklist was first tried out on 116 male and female students and then validated on an independent sample of 126 female undergraduates at Ohio State University. A regression equation was determined for the Ohio State Psychological Examination (OSPE) and used to calculate an index of achievement (AI) score for each student. The index was the algebraic difference between actual and OSPE-predicted grade-point average. Then 32 sets of 5 items each were constructed, and a biserial correlation was computed for each item against the AI. The resulting coefficient became the discrimination index (DI). The check list of items was then factor analyzed, yielding a general factor and five group factors: study skills, orientation, motivation, background, and adjustment. The first 16 sets of items yielded a level score of over- and underachievement which correlated near zero with college aptitude and worked equally well for both high and low OSPE groups. The second 16 sets provided a profile of relative strengths and weaknesses. This part was found to be relatively independent of overachievement and underachievement.

Weigel and Weigel (1967) attempted to relate knowledge and usage of study skill techniques to academic performance. The sample included 106 males and 139 females, all undergraduates at Oregon State University. Instruments used included the Brown-Holtzman Survey of Study Habits and Attitudes (SSHA) and the Scholastic Aptitude Test (SAT), and the criterion was GPA. The SSHA was completed twice by each student. For one administration the subjects were instructed to respond according to what was actually the case (usage) while for the second administration they were to respond according to what they thought would be ideal (knowledge).

The authors found usage of study skills and attitudes moderately correlated with academic performance for both sexes, but there were marked sex differences for ideal-GPA correlations. The ideal-GPA correlations were fairly large for males only, and the knowledge scores predicted academic achievement better than did SAT scores for them. The degree of agreement between knowledge and usage of study skills and habit contributed little or nothing to the multiple-regression prediction of grades using SAT scores.

Another conclusion of the study was that college students generally know how to study but that they do not necessarily employ this knowledge. The contention that many college students know little about effective study methods and therefore must be taught such methods in special how-to-study courses was not supported by this study. The authors suggested that achievement improvement which has been noted in studies of such courses may be the result of some other factor, such as the group process, rather than because of the increase in the students' knowledge about studying.

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Chapter 5

INTEREST AND ACTIVITY CORRELATES OF ACADEMIC ACHIEVEMENT

It seems logical that a student will do better academically in a course if he is interested in the subject matter of that course. On the other hand, there are individuals who will obtain good grades in any course whether they are interested in the subject matter or not. Even for such individuals, however, it might be hypothesized that they would learn more or benefit more if they were interested in the course content, even though their grades were not better. Such thinking would support a contention that interest inventories should be more useful for differential prediction than for absolute prediction of college success.[5]

Some would contend that great interest in learning for a course might mean lower grades for certain people. If they were so interested in the subject matter that their emphasis was on learning and applying rather than on grades, their grades could suffer in some courses, according to this viewpoint.

The Kuder Preference Record and the Strong Vocational Interest Blank have commonly been used in studies focusing on interests as correlates and predictors of grades, persistence, and learning. Interviews and locally developed questionnaires have also been utilized extensively to gather interest information.

Concerning extracurricular activities, it is easy to assume that heavy involvement in out-of-class activities will use up a student's energy and thus interfere with his persistence, grades, and learning. On the other hand, some people hold the view that such activities relax the student, make him more confident in himself, and force him to use his study time more effectively. In addition, they would point out that some of the extracurricular activities are related to what is being taught in the classroom. For years, student personnel administrators have emphasized that students can gain valuable practical experiences by applying what is learned in class to the extracurricular situation. Such people see the extracurricular realm as an important part of the curriculum or as a "co-curriculum" rather than being outside of the curriculum (which is implied by the term "extracurricular").

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[5] In predicting grades for a group of courses or majors, differential prediction searches out what is unique about each course so that relative success in the various courses or majors is predicted. Absolute prediction searches out what is common among the courses or majors so that overall success across them can be predicted. Absolute prediction is desired for administrative decision making, e.g., college admission, while differential prediction is desired for individual guidance and decision making concerning majors and courses.

As is true of the variables covered in the other chapters of this monograph, there are probably a number of confounding variables that mask relationships between academic success and interests or extracurricular activities. Also, as was true for studies of the other variables covered in this monograph, oftentimes no attempt was made to control for such confounding variables.

Interests

Interests as Correlates of Grades, Persistence, and Academic Learning: Selected Annotations

Faunce (1968) checked records for 1,249 women five years and two quarters after they matriculated at the University of Minnesota. The 723 who had graduated were compared with the 526 who had not graduated on personality characteristics and vocational interests. The Strong Vocational Interest Blank (SVIB) was the interest measure and chi-square analysis and tests of differences between proportions were the methods used to explore differences on the SVIB scales. Those women graduating had a more professional and academic orientation which corresponded to their abilities. Nongraduates found it difficult to persist, no matter what their abilities, because their interests were primarily in business and practical-arts occupations.

French (1965) wanted to find out the types of interest activity that work best in predicting grades and satisfaction. He compared *Cooperative Interest Index* scores with the grades of college freshmen in six courses and with senior-year reported satisfaction in 11 different major fields as perceived by 1,536 of those students remaining through the senior year. Grades were best predicted by items that pertained to academic learning activities or to activities appropriate for younger students. End-of-senior-year satisfaction with major field was best predicted by reading activities or activities that suggest professional work in the field.

Johnson (1965) correlated Strong Vocational Interest Blank (SVIB) interests with differential measures of academic achievement in a sample of 1,875 freshman students at the University of Minnesota. The scores on 25 SVIB scales were correlated with scores on the four American College Tests (ACT) — which he considered to be achievement tests — and six achievement difference (ACT difference) scores. SVIB scales did not correlate as high with differential achievement as with absolute achievement except when dealing with students of about equal scholastic aptitude (as measured by the Minnesota Scholastic Aptitude Test which generally correlates highly with ACT Composite Score). The authors concluded that the commonly made assumption that SVIB scores can be useful as indicators of differential academic achievement is unwarranted.

A 1954 study had indicated that interest inventory scores were related to engineering grades for noncompulsive students, but not for compulsive students. Therefore, *Kellogg* (1968) attempted to replicate that study using 212 male engineering students in the College of Engineering at Alfred University. Students scoring below the median for the group on the Strong Vocational Interest Blank (SVIB) accountant scale constituted a "noncompulsive" group and those scoring above the median constituted a "compulsive" group. A second pair of subgroups was formed using the Cooperative English Test (CET). The regression line of the CET Speed of Comprehension score on the CET Vocabulary score divided the group into a second "compulsive" group and a second "noncompulsive" group.

For each of the groups, correlations were computed between freshman GPA and each of ten SVIB occupational scales. Results suggested that only the SVIB Accountant scale was acting as a moderator in the direction expected from the earlier study, and the correlations for both the groups were very small. Conversely, use of the CET as a compulsiveness indicator resulted in higher predictive correlations for the compulsive students.

Martin (1964) studied predictive efficiency of an academic interest scale she developed for the Strong Vocational Interest Blank (SVIB). She used 2,153 liberal arts and engineering students at the University of Pittsburgh to test two sets of scales for each of three groups: liberal arts and sciences females, liberal arts and sciences males, engineering and mines males. A double cross-validation procedure was followed in developing and testing out the scales.

The multiple-regression analysis was the analytic method used. The academic interest scales added significantly to the multiple correlation above that obtained with Scholastic Aptitude Test scores and high school quintile rank in five of the six cases where first-year grade averages were predicted.

Miller (1964) studied Montana State College freshmen in three introductory psychology classes by relating ability scores (Ohio State Psychological Examination) and scores on the Knowledge Interests Tests to course grades. For cross-validation purposes, two groups of students were used for each instructor. Multiple-regression analysis was the statistical tool used.

It was found that ability usually, although not always, was superior to interests in predicting academic achievement. In addition, the pattern and magnitude of the correlations between interests and GPA were distinctly different from instructor to instructor. Factors affecting the prediction depended on which instructor was involved, whether specific or general scoring keys were used, and whether original or cross-validation samples were considered. The degree to which students and instructors had a similar interest pattern in a variety of college subjects accounted for a significant amount of the criterion variance for all three instructors, and this also held up in two of the three cross-validation samples.

Stricker (1966) studied the moderator effect of compulsivity on the correlations of Strong Vocational Interest Blank (SVIB) scores with GPA. Using 743 freshman men and 393 freshman women and two measures of compulsivity (the SVIB Accountant scale and a ratio score of reading speed to vocabulary), Stricker determined that compulsivity did affect the correlation for male engineering students, although it did not for liberal arts students (both sexes). The SVIB correlations with GPA were higher for less compulsive engineering freshmen than for more compulsive engineering freshmen. It was evident that the two compulsivity scales were measuring different factors, and using them in combination as moderator variables had no practical effect. The authors concluded that the stability and generality of moderator variables should be held in question.

Taylor, Lezotte, and Bondy (1967) wished to determine whether or not Strong Vocational Interest Blank (SVIB) scores obtained at college entrance could differentiate students who successfully complete a 2-year college technical program from those who withdraw from the program. Therefore, 46 SVIB subscale score mean differences were examined (using the *t* ratio) for 30 students randomly selected from the graduation group and a group of 30 students randomly selected from those who had withdrawn from school. All of the subjects had enrolled in 2-year collegiate technical programs at Ferris State College in 1962.

Significant differences ($P < .05$) were found for 16 of the 46 comparisons made (35%). It was concluded that successful and unsuccessful male collegiate technical students may be differentiated by using an interest measure. The successful technical students seemed to be "thing" oriented while the unsuccessful students seemed to be "people" oriented.

Wagman (1964) explored the extent to which high school grades that are higher than predicted, based on abilities, will persist as overachievement in college. He also wanted to know how interests relate to such persisting patterns of overachievement.

For a sample of University of Illinois freshmen in four separate curricula, he found that the high school achievement discrepancies did tend to persist in college. He also discovered that there was a positive relationship between scholastic overachievement and the Kuder Preference Record conflict-avoidance, ideational, computational, and literary scales. There was a negative relationship with the Kuder mechanical scale.

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Extracurricular Activities

Extracurricular Activities as Correlates of Grades, Persistence, and Academic Learning: Selected Annotations

Anderson (1966) studied the relationship of employment to academic performance and academic load for 202 California junior college students. First, grade-point average (GPA) for a group of 34 students employed 40 or more hours a week was compared with a matched group of 34 nonemployed students. The groups were matched on age, sex, marital status, units attempted, and total scores on the American Council on Education Psychological Examination (ACE). Secondly, 31 bright (eligible for admission to the California State Colleges) employed students were compared on GPA with 31 bright nonemployed students who were matched to the first group on ACE scores. Similarly, matched groups of lower ability students (not eligible to enter the state colleges) were also compared on GPA.

Analysis using *t* tests indicated there were no signficant differences between employed and nonemployed students on mean GPA earned, number of units attempted, and number of units completed. The authors concluded from this: (a) that employment status is generally not an important factor in poor scholarship, (b) that the academic performance of marginal students is not affected by employment any more than is the performance of academically able students, (c) that students with financial problems should be encouraged to work part time even if they have low grades, and (d) that the conditions of employment rather than the fact of employment may be the key to whether or not part-time work has an effect on grades.

Barger and Hall (1965) related expected college activities to ability and achievement for a sample of 1,544 entering freshmen at the University of Florida. A family background and planned college activities schedule was administered. Students were divided into three groups on the basis of School and College Ability Test (SCAT) scores, and each of the groups was subdivided into thirds on the basis of grades.

There was a negative relationship for males between ability and expecting to take part in fraternity, athletic, and religious activities, but a positive relationship with political and preprofessional activity expectations. For females there was a negative relationship between ability and expecting to join a sorority, but a positive relationship with planned activities in communications, religion, and the arts.

When GPAs of persisting students were examined at the various ability levels using chi-square analysis, it was discovered that men in the middle- and low-ability groups who planned athletic activities or who planned to join fraternities achieved significantly lower GPAs than did men who planned no such participation. For women, such a finding was noted for the low-ability group only, and it pertained to sorority-participation plans. Another significant finding pertained to the high ability group of persisting women. For this group of women, those checking an interest in religious activities achieved higher grades than those not interested in religious activities.

When dropouts were compared with persisters on entrance extracurricular activity plans, only two statistically significant group differences were noted. A significantly larger percentage of the persisting men checked "religious activities" than did dropout men (42% versus 31%). This difference approached statistical significance for women. Secondly, a significantly larger percentage of dropout women checked "other activities" than did persisting women (7% versus 1.5%), a fact which may mean that the dropout women had more variable interests. In addition to the significant differences, there was a tendency noted which suggested that fraternity-sorority and athletic participation plans were what provided enough motivation for some students to stay in school. Dropping out of school would cause them to miss out on the satisfactions experienced from participating in those activities.

Behring (1966) administered an activities index instrument to 288 entering 1961 freshmen at Ripon College. Those items which differentiated between high and low achievers (upper third of the class on GPA versus the lower third of the class) were combined to form an Activities Preference Achievement Scale (APAS).

After a quantitive scoring system was developed for APAS, the scale was administered to 249 entering 1962 freshmen for cross-validation purposes. Significant APAS mean differences were found between the high- and low-achievement groups in the second sample of students. When APAS was combined with High School Rank (HSR) and Scholastic Aptitude Test (SAT) scores in a multiple regression-equation to predict GPA, it was discovered that APAS made a significant contribution to the prediction of GPA. The contribution was not as large as that made by HSR and SAT-Verbal, however.

Using a sample of 674 students who entered a large midwestern university in the fall of 1958, *Hartnett* (1965) explored the relationships between degree of involvement in extracurricular activities and changes in student academic performance during four years of college. The students were classified into performance-change groups according to the difference between their actual GPA for the year and the GPA predicted using a regression equation based on the previous-year GPAs. For the sophomore, junior, and senior years, each student was classified into one of three groups that were further subgrouped according to sex: positive GPA changers, negative changers, and stable on GPA.

During the senior year, the students responded to an activities questionnaire that had them list for the various school terms their extracurricular activities, positions held, and hours of their time required. The activities information was converted into activities participation scores which were used to place the students into high-, middle-, and low-activities groups for each year.

Chi-square analysis results did not allow, in any case, rejection of the null hypothesis that there would be no relationship between degree of involvement in extracurricular activities and changes in scholastic performance. Even though the differences were not statistically significant, however, the data did suggest that considerable immersion in extracurricular activities is associated with a negative change in academic performance more often than one would normally expect.

Hay and Lindsay (1969) wondered if there are differential rates in achievement among groups of students not working, working up to 15 hours per week, and working 16 or more hours per week when aptitude is statistically controlled. Therefore, freshman and sophomore Pennsylvania State University students in each of three categories (baccalaureate degree males, baccalaureate degree females, and associate degree students — who were mostly males) were separately divided into working and nonworking subgroups. The working subgroups were further divided into those working 15 or less hours and those working 16 or more hours. Working students were compared with nonworking students using analysis of covariance to partial out differences in Scholastic Aptitude Test Scores. A SAT mean comparison was made between the two categories of employed students for each curricular group to make sure they were equally able, and then grade comparisons were made separately for freshmen and sophomores.

The study used student data for the fall quarter of 1965 and these were students who re-enrolled for the winter quarter. A replication study was completed using students who were enrolled exactly one year later and using data for the fall quarter of 1966.

Significant differences in aptitude levels and in observed and adjusted GPAs were found between employed and unemployed baccalaureate degree males ($P < .01$) and baccalaureate degree females ($P < .05$) for the 1965 sample of students. The unemployed students had a higher adjusted GPA mean for both groups, while the difference (in favor of employed students) was statistically nonsignificant for the associate degree students. For all three groups of 1965 employed students, the students working the fewer number of hours per week had a higher term GPA average. Furthermore, there was a trend for students working 15 or less hours to have a GPA average as high or higher than the unemployed students.

The replication study found different results from Study 1 for employed-versus-unemployed comparisons. Employed and unemployed baccalaureate students (both male and female) had almost identical aptitude means and GPA means. For associate degree students a reversal occurred, with unemployed students having a higher mean than did employed students (although once again the difference was not statistically significant). The employed student differences of Study 1 were replicated in Study 2.

Holland and Richards (1965) intercorrelated scores on the American College Tests (ACT), 18 scales of high school extracurricular achievement, and high school GPA for 7,262 college freshmen at 24 colleges. They found the correlations between the measures of academic and extracurricular accomplishment to be generally negligible (medium $r = .04$). These results could not be attributed to either a narrow range of academic talent or to nonlinear relationships. The results strongly suggested to the authors that academic and extracurricular accomplishments were relatively independent dimensions of talent.

Smith and Dizney (1966) compared freshman football players ($N = 32$) and varsity football players ($N = 28$) to matched groups of nonathletes. All of the students were enrolled at Kent State University during the 1964-65 academic year, and the football and nonathlete groups were matched on American College Test (ACT) Composite Score, matriculation date, and curricular major. Comparisons between the athlete and nonathlete groups were made on GPA means and Survey of Study Habits and Attitudes (SSHA) means. In addition, the varsity football players were interviewed for self-perceptions of the effects of participation.

Results using *t* tests and percentage comparisons were that participation in football did not adversely affect academic achievement and progress over a long period of enrollment. In fact, the tendency was for the football players to be slightly superior "in both amount and quality of overall academic achievement" to matched nonathletes. (The GPA difference was accounted for entirely by the fact that the football players had a significantly higher out-of-season GPA [$P < .05$] than did the nonathletes.) Similarly, the varsity athletes and their nonathlete peers did not differ significantly on study habits and attitudes or on frequency of summer school attendance. Over two-thirds of the varsity athletes interviewed felt that their intercollegiate football participation had either helped them scholastically or made no difference.

Vaughan (1968) hypothesized that extracurricular involvement interferes with scholastic achievement resulting in withdrawal or dismissal from school. The sample included 157 male students who failed to continue until graduation at the University of San Francisco, where they started as freshmen. Of this number 87 were dismissed for academic reasons and 70 dropped registration voluntarily. Instruments used included yearbook listings and records of various campus organizations.

Activities in five different extracurricular-activity categories were related to withdrawal status: withdrew, dismissal, randomly selected persisters. The five categories were student body offices, athletics, fraternities, clubs, and others (debating, band, newspaper, radio station). Only 8.6% of the withdrawal group participated in one or more of the extracurricular areas, while the percentage was 20.7% for the dismissed group and 31.1% for the persisting group. The difference between the first and third percentage was the only difference found to be statistically significant at the .01 level. These results suggested that extracurricular activity is not a contributing factor in nonpersistence, and that such activity may instead act as a dropout deterrent.

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Chapter 6

SELF — OTHER CORRELATES OF ACADEMIC ACHIEVEMENT

Probably all of the other variables considered as predictors in this monograph are influential factors, to a lesser or greater extent, in the development of a student's self-concept. Yet, self-concept is a separate and unique idea and should be treated as a separate variable, especially in terms of whether the student has confidence and a positive outlook about himself. Self-concept scales may be valid predictors of academic success and should be explored. Also relevant here are a person's pre-experience self-predictions about whether he will persist, the grades he will earn, and how much he will learn and retain.

The student himself is not the only one making predictions about his academic success. It is common for high school teachers, counselors, peers, parents, and others to make predictions about the academic success of individual students. These different groups of raters have access to different sources of information about the students being evaluated, and they have different motivations in making the evaluations and may be biased in their thinking. Furthermore, different people see the students from different perspectives and have different backgrounds. It would be useful, therefore, to know which of the above types of raters can make the best predictions of academic success and what characteristics differentiate an effective rater from an ineffective rater.

Differentiating effective raters from ineffective raters and exploring the underlying reasons for the differences in predictive results could lead to more effective rating practices. For example, certain information and considerations utilized by peers could possibly allow the counselor or teacher to predict academic success more effectively.

If a researcher does not differentiate effective raters from ineffective raters when he studies the predictive efficiency of other-ratings, he is inviting indeterminate or negative results. Analogous to this are studies of counselor effectiveness. Many people feel that the "no impact" findings obtained through the years were the result of not differentiating "good" counselors from "poor" counselors prior to looking for overall impacts of counseling.

Another consideration, which also applies to all the other predictors covered in this monograph, is that ratings by others may be more effective predictors for specific types and groups of students. Certainly these matters are worthy of study. Explorations of the effect on predictive efficiency, of different rater characteristics, of extenuating circumstances such as the mood of the rater, the campus atmosphere, the time of the year, and weather conditions could also be useful.

Not only may the ratings of significant others about a student be predictive of academic success, but so may the type of interpersonal relationships which exist between the student and others (significant others or otherwise) be valid predictors. It would be expected that a good relationship with parents, teachers, peers (and especially close friends and roommates) could help facilitate achievement if it does not distract the student's attention from his achievement goal. On the other hand, a highly popular and socially inclined student may be more concerned with social relationships than with academic achievement, and his grades or persistence could suffer because of this. "Family relationships" as correlates are covered in Chapter 7, but studies involving interpersonal relationships with other than the student's own family are included in the last section of this chapter.

Self-Concepts

Self-Concepts as Correlates of Grades, Persistence, and Academic Learning: Selected Annotations

Borislow (1965) hypothesized (1) that achieving students would show higher general self-evaluation prior to academic performance than would underachievers when scholastic achievement is a prime goal. Self-evaluation was defined in terms of the discrepancy between the self-perception and the perception of the ideal, and achievement status was defined in terms of the discrepancy between Scholastic Aptitude Test (SAT) predicted grade point average (GPA) and actual GPA earned for the first semester. He further hypothesized (2) that achievers would increase and underachievers would decrease their general self-evaluation from pre- to post-semester assessment, when self-evaluation is high and scholastic achievement is a prime goal, (3) that no difference in self-evaluation of themselves as students would be found between achievers and underachievers prior to academic performance, when scholastic achievement is a prime goal; and (4) that achieving students will show higher self-evaluation of themselves as students than will underachievers after academic performance, when scholastic achievement is a prime goal.

Two self-concept instruments were used for the study. First, the 197 entering arts and science freshmen at the University of Pennsylvania, who constituted the sample, completed a modified version of Fiedler's 24-item adjective scale, and they completed this instrument four different times. They were asked, first, to view themselves in a general way; second, to view themselves as students; third, to view what they would ideally like to see in themselves in general; and fourth, what they would ideally like to see in themselves as students. A second instrument completed by the students was the Student Behavior Description. This questionnaire identifies which of five "goal areas" are prime goals for the student while he is in college: organizational leadership, scholastic achievement, ethical conformity, social acceptance, and self-adjustment. This entire procedure was repeated again after the first semester.

Mann-Whitney *U* tests were conducted to test the hypotheses. Hypotheses 2 and 4 were supported, but Hypothesis 2 would not have been supported if the focus had been on students with other than scholastic achievement as their prime goal during college. Hypothesis 1 was rejected regardless of the student's prime goal during college, but Hypothesis 3 would have been supported had the focus been on students with other than scholastic achievement as their prime goal.

Coombs and Davies (1966) selected a random sample of 186 freshman students at Washington State University to explore several hypotheses. Among the hypotheses were (a) status in a social system, as viewed by others, acts to a certain extent as a performance ceiling, and (b) self-confident students who anticipate receiving high grades are advantaged in the grading process because of the socially desirable personality image that they create.

During the first week of classes 181 of the students were asked what kind of students they thought themselves to be. They were also asked to estimate their chances of receiving at least a "B" average during their first year of college work. The research design involved an analysis of the relationship between high school and college grades through the introduction of two self-concept variables ("self-conception of scholastic ability" and "expectation of obtaining superior college grades") and an analysis of the relationships among all the variables. Chi-square tests of independence and *t* tests were used for comparing the percentage distributions and the means, respectively.

The results were that those with high scholastic records had loftier conceptions of their scholastic ability and expected to obtain higher college grades than did those with less impressive high school records. Furthermore, they usually obtained the high college grades expected, and their social and self-expectations were realized. The authors interpreted this as support for the symbolic interactionist position which contends that formal and informal evaluations of scholastic ability by significant others provide a "looking glass" by which students come to view themselves and that they gear their behavior and performance accordingly.

Guerney and Burton (1967) explored the individual's perception of the differences between himself and his peers and the relationship of these perceptions to academic achievement. A group of 51 high-GPA achieving freshmen at Douglas College and a group of 42 low achieving freshmen matched to the first group on Scholastic Aptitude Test (SAT) Verbal and SAT Quantitative scores were administered the Interpersonal Check List (ICL). The subjects were told to check the ICL, first as descriptive of their Self, secondly as descriptive of their Typical Classmate, and finally as descriptive of their Ideal-Self.

Each set of responses was scored on the dominance scale (high scores mean manage others, bossy, or like responsibility as opposed to shy, timid, or passive) and the loving scale (high scores mean agreeable, fondness toward others, kind, generous, sympathetic versus critical, selfish, unfriendly, or strict). Means for the scores and the discrepancy scores (Self-Typical Classmate and Self-Ideal Self) for these two scales were computed and the group-mean differences tested using two-tailed *t* tests. The .05 level of confidence was used for significance, with probabilities less than .10 being taken to indicate a "notable trend."

Three of the discrepancy variables all showed trends, and they all involved typical classmate dominance. Another trend was for high achievers' Self to be lower in loving. The one statistically significant finding was that the high achievers' typical peer was lower in dominance. The interpersonal variable that seemed to link these findings together, according to the authors, was competitiveness.

Irvine (1965) studied the utility of student self-predictions of freshman year average. The sample included 783 male and 708 female freshmen at the University of Georgia. Prior to registration for their first college experience, they completed a questionnaire. One question asked them to circle the grade (there were nine choices, from F to A+) which they thought they would most likely attain by the end of the year.

The respective male and female estimates correlated .29 and .36 with actual grades. Multiple R's of .55 and .63 using the regular predictors (Scholastic Aptitude Test scores) were not raised significantly by including estimated grades. Estimated grade average accounted for only 1.1% of the GPA variance for men and 2.5% of the GPA variance for women.

Jones (1968) attempted to improve prediction of academic achievement by use of intellectual variables to complement the usual predictive devices. The sample for the study was considered to be representative of rural Wisconsin youth. Nonintellective variables used were self-expectation as a student (SE), self-concept as a student (SC), and the degree of identity development (IRS). The instruments used included short self-report inventories developed over the previous five years and the Henmon-Nelson Test of Mental Ability (H-N).

When intercorrelations were computed, it was found for this particular population that the nonintellectual factors were positively related to academic achievement and intelligence. The correlations with GPA were larger than those typically obtained in predictive studies of this nature (in the .50s and .60s for SC, the .30s for SE, and the .30s and .40s for IRS).

An interesting discrepancy was noted between the results for males and females. When multiple-regression analysis was used to predict GPA (in equations which also included H-N ability scores), all predictor variable except IRS had significant beta weights for males ($P < .05$). For females, all predictor variables except SE had significant beta weights.

Using 96 freshman and sophomore men at the University of Pennsylvania, *Kaufmann* (1963) attempted to test hypotheses concerning task performance that were derived from Vroom's Self-Concept Balance Model. Subjects were presented with a short version of the Raven Progressive Matrices, and some were told that they would at times receive monetary reward for success. They had been led to believe that they had a high level of the ability in question. At first they were allowed to succeed and later told that they had then failed. Comparisons were made between those who had offered a reward and those who had not at various points to see the effect of a relevant Self-Concept on actual performance and the effect of a suddenly unbalanced self-concept on actual performance.

As had been predicted, the degree of relevance was found to be positively related to student's estimated probability of success, amount wagered, and performance speed and negatively related to self-rating of ability after the failure. In addition, outcome value was positively related to performance speed.

Knop (1967) hypothesized from a symbolic interactionist point-of-view that the student who tries hardest to comply with the outside expectations for his role will elicit more complimentary feedback from those important to him than will others who do *not* try as hard, which in turn will give him a more positive self-concept that will help him from dropping out. To provide evidence concerning this hypothesis, he split a group of 127 University of Arizona freshmen (who were shown to be representative of the entire university population through the use of chi-square analyses) into the four student types noted by Trow, Gottlieb and others: vocational, nonconformist, collegiate, and academic. Then he compared the groups on responses previously made (as a part of another study) to a campus satisfaction questionnaire.

Chi-square analysis indicated that the academic students received more positive responses to their behavior in the campus setting, were more satisfied with their student status, and dropped out of school less often. The hypothesis was supported by the results of the study.

LeMay (1969) attempted to clarify the relationship between self-actualization and achievement and to comment on research done previously by Leib and Snyder (1967, 1968). The sample included 205 male and 206 female freshmen at Oregon State University. The Personal Orientation Inventory was administered to the students during their first week in a psychology course on personality and development. In addition to this inventory, grades and Scholastic Aptitude Test scores were also used.

The sample was divided into low, middle, and high ability groups. The partial correlation between self-actualization and achievement was negative and significant for the middle ability groups (both male and female) only. The results tended to support the findings of Leib and Snyder that self-actualization and achievement are not directly related but that they are related on a secondary basis through separate relationships with other variables.

Marks (1967) related student expectancies concerning persistence in college and sources of conflict leading to withdrawal from college with selected precollege performance, scholastic ability, and performance variables. The sample included 1,000 entering Pennsylvania State University freshmen who for the study completed a questionnaire having objective and some open-ended questions.

Correlations, computed separately for the groups having a high and low probability of college dropout, indicated that the high-probability group was more concerned with satisfying parental expectations and that failure to do so produced anxiety and guilt. Initially they exhibited adequate achievement but subsequently became underachievers.

Those having a tendency to drop out had conflicts between the way they saw themselves and the feedback from the college environment, and these conflicts were difficult for them to resolve. They were aware of these conflicts and the possible outcomes, however, as indicated by their precollege expectancies.

It was originally intended to factor the correlation matrix, but the joint probability density function of the variables was so nonnormal that the results of factor analysis would be questionable. Therefore, "factoring" was done by inspection. Perceived reasons for college withdrawal generated a three-dimensional space, the defining vectors being academic and work skills and their utilization, motivation, and adjustment.

Interestingly, dropouts spoke mostly of external or personally acceptable causes for withdrawal when referring to themselves. Conversely, reasons given by them for the withdrawal of other individuals usually involved primarily personal weaknesses that they perceived in the other person.

Pervin and Rubin (1967) used a transactional approach in studying student dissatisfaction with college and factors in student dropout. The sample included 5 Princeton upperclassmen who completed the Instrument for the Transactional Analysis of Personality and Environment (ITAPE), on which students rated the concepts of self, college, students, and ideal college using a semantic differential technique.

Discrepancy scores between the students' perceptions of self and of the college, and their perceptions of the college and the ideal college were correlated with responses to the dropout portion of the ITAPE questionnaire. Discrepancies betwen self and college, self and students, and college and ideal college ratings were all significantly related to reported probability of dropping out for nonacademic reasons and to nonacademic dissatisfaction with college.

Vacher (1963) explored self-concept differences among four groups of women college students: freshman achievers, freshman underachievers, upperclass achievers, and upperclass underachievers. Each group consisted of 30 women enrolled as students at Ohio University. Achievers were those who scored above the 80th percentile on the Ohio State University Psychological Examination (OSPE) and maintained a cumulative GPA of 3.0

or above, while underachievers also scored above the 80th OSPE percentile but had a GPA of 2.3 or less. Self-concept data were gathered through the use of Gough's Adjective Check List (ACL).

Correlations computed between the ACL scale scores (self-acceptance, self-criticality, and favorability) and GPA for the combined group of students were all in the low teens. When t tests were conducted on the mean differences among groups, it was found that the upperclass achievers had significantly ($P < .01$) higher self-acceptance and favorability scores than did the upperclass underachievers. The differences between achievers and underachievers at the freshman level were in the same direction, but quite small in comparison to the differences at the upperclassman level.

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Ratings of Others

Ratings of Others as Correlates of Grades, Persistence, and Academic Learning: Selected Annotations

Bartlett and Green (1966) hypothesized that clinical prediction may be made less efficient by the inclusion of too many predictors. The sample included six psychologists from the University of Maryland Counseling Center who were experienced in dealing with college students. The psychologists were to predict first-year GPA for 40 college students with 4 predictors and with 22 predictors and under two different conditions. The 4 predictors were also a part of the 22 predictors. All predictors in the study were selected from a larger pool based on the judged relevance to the criterion.

The increment in multiple correlation of the 22-predictor situation over the 4-predictor situation alone was less than .01. The variance of predictions was slightly higher under the 4-predictor situation, but the difference was not significant. Both methods yielded over-estimates of GPA, and the mean predicted GPA was identical under the two conditions.

Cashen (1967) compared the accuracy of three distinct groups of persons, who presumably had the greatest ego involvement in student-achievement outcomes, in predicting first semester GPA. One hundred and ten freshman students taking general psychology at Illinois State University satisfactorily completed a questionnaire in which they listed each course they were taking and the number of semester hours, gave names and addresses for their parents, identified the counselor in high school whom they had talked to most about attending college, and circled the letter of the final grade they expected to achieve in each course they were taking. The corresponding parents and high school counselors were then contacted by a letter which explained the study and asked them to circle the course grades they thought the student would receive for each course.

When the student-, parent-, and counselor-predicted grades had been added and converted to a cumulative GPA, these were correlated with the accumulated GPAs actually obtained by the students. The correlations were .54, .60, and .59, respectively. Analysis of variance procedures indicated there were no significant differences between the three predicted GPA means, but *t* tests indicated that the differences between the actual GPA mean and the three predicted GPA means were all statistically significant ($P < .01$). All three groups tended to over-predict. Each group of people predicted college grades about as efficiently as the commonly used high school rank (HSR) and aptitude measures.

Coombs and Davies (1967) related ratings of sociopsychological adjustment to scholastic success for a sample of 186 freshmen at Washington State University. Adjustment ratings were made by student leaders, fraternity and sorority presidents, and dorm sponsors.

The high-adjustment group had a mean GPA of 2.74 and the low-adjustment group had a mean GPA of 2.13. A two-tailed *t* test was used to determine that the observed mean grade difference between the groups was statistically significant.

The two groups were also compared on judgments about their motivations, and those rated high in conformity tended to earn better grades. From the results obtained in the study, variables such as conformity, motivation, and organizational effort would seem to have more promise for predicting scholastic success than do measures of sociability or emotional adjustment.

Nichols and Holland (1964) compared nine alternative methods for selecting National Merit Finalists who would have maximum achievement during the first year in college. As with other scholarship programs and with selective college admissions, the problem is to select a few of the most promising students from a large group of applicants who scored high on an aptitude screening test.

A random one-sixth sample of National Merit Finalists who graduated from high school in 1960 were sent quesionnaires to gather nonintellective data about the students. Over a year later, the students were again polled by mail for data concerning first-year college performances on GPA, leadership, scientific achievement, artistic achievement, and exceptional achievement (rare achievements that included outside recognition). For each of the nine selection methods, the students were sorted into a selected group and a nonselected group. The groups were then compared on their actual college achievements using *t* tests for the GPA criterion and chi-square analysis for the other four criteria.

Committees analyzing all available measures appeared to select students for academic achievement better than did the best available objective method, but the evidence on this was not conclusive because of a difference in selection ratios. The selection committee appeared to be less effective than were the best objective methods, however, in identifying students with potential for extracurricular achievement in college. Another finding was that selection on the basis of a broad range of high school achievements resulted in a broad range of achievements in college without lowering the level of academic performance. Furthermore, adding personality and interest variables to the high school achievement measures tended to decrease, rather than to increase, the predictive efficiency.

Prien and Lee (1965) used the techniques of "peer ratings" and "leaderless group discussions" combined, in a classroom situation, to obtain assessment measures that would be correlated against intelligence and class grades. He was also interested in the reliability of such measures.

Twenty-six students in a junior-level psychology course were divided into four leaderless discussion groups which met every third session, after every two sessions of lecture, as a part of the course. The construction of the peer rating form was a class project; and it was agreed that the ratings would be included in the final grades for the course, the only requirement by the instructor being that the dimensions and technique decided on be rational and consistent with previous research on the topics of criterion development, merit rating, and peer ratings. The scale dimensions finally decided on were: (a) coordination and organization; (b) ideas, information, and resources; (c) effort; and (d) interpersonal relations.

Three times during the six-week course period each student was instructed to rate himself and each member of his discussion group on the four scales. For each individual, the third administration self-peer ratings were combined into scale scores, which were then correlated with scores received on the final course exam and with scores on a general intelligence test. All four scales correlated higher with course exam grades than with intelligence, and the correlation with final exam scores for (a) coordination and organization, (b) ideas, information, and resources, (c) effort, and (d) interpersonal relations were .29, .34, .18, and .77, respectively.

A couple of possible hypotheses were expressed concerning why "interpersonal relations" had such a high positive correlation with final exam scores. It is also noteworthy that "interpersonal effectiveness" correlated —.43 with scores on the general intelligence test (the PRI Classification Test). The use of centroid factor analysis on scores from the third administration of the four scales revealed three factors: a halo factor, an interpersonal effectiveness factor, and a productivity factor.

Smith (1967) investigated the usefulness of peer ratings of personality in predicting academic success. He felt that assessment of personality by accumulating perceptions of peers had several advantages over personality inventories, advantages which could lead to better prediction of academic success: (a) the information is gathered in a nontest context of the individual's real-life environment; (b) the information is accumulated over long periods of time with the result that greater representativeness might be expected, and (c) the information is accumulated and stored by numerous observers who view the individual from different perspectives and relationships.

In the peer-rating technique used for this study, each rater examined 42 bipolar personality traits and for each trait selected the five members of his peer group most like the left-hand pole and the five peers most like the right-hand pole. When the traits were analyzed separately for a group of college students, a group of high school students, and a group of nursing students, it was determined that the factor analytic structure of the 42 personality variables studied was highly stable from sample to sample within and across populations.

The college sample consisted of 348 Boston University undergraduate students, and the peer ratings were collected prior to the first mid-term exam so that class grades would not influence ratings. For this sample, regression analysis was used to predict end-of-year GPA. In addition to the peer ratings, 13 different measures of academic aptitude (two of them being SAT-Verbal and SAT-Quantitative), 15 scores from the Edwards Personal Preference Schedule (EPPS), and 2 high school performance measures (high school rank corrected for class size and number of certified high school units) were also included as predictors in the analysis. The analyses were stopped after 10 variables had entered the prediction equation, and at that point the multiple correlation with GPA was .64; and all 10 variables were peer variables, 2 were aptitude variables, and 2 were the high school performance variables. The total contribution to R^2 made by the four types of variables were peer ratings — 68%, aptitude — 19%, high school record — 13%, and EPPS — 0%. Peer variables belonging to the factor called "strength of character" were found to be especially important nonintellective correlates of academic success.

Titus (1969) investigated the use of peer nomination techniques in a college dormitory setting for predicting academic success among incoming freshmen.

The sample included 112 female and 140 male freshmen at Muskingum College. The subjects were asked to nominate in order the members of their dorm unit they expected to be the three highest and three lowest for each of two variables, GPA and academic motivation. Peer nomination forms were given out three times: at the end of orientation week; after five weeks of class but before midterm grades were released; and after 11 weeks of class, which was well after midterm grades had been released.

Peer nominations remained reasonably stable over the 11-week period, and substantial overlap between the two peer-nomination variables. The correlations with GPA at Time 1 (at the end of orientation week) were almost as high, for both types of peer nomination scores, as were the correlations for SAT-Verbal and SAT-Quantitative. Furthermore, both peer-score correlations with GPA increased a substantial amount from Time 1 to Time 2 and again from Time 2 to Time 3. The correlations with GPA for Time 3 were .58 for the GPA peer nominations and .67 for the academic-motivation peer nominations. Partial correlations with SAT scores held constant revealed that the nomination technique, especially when academic motivation was the subject of the nominations, "topped" variance not accounted for by the SAT scores. The peer-nomination technique was suggested by the authors as having potential use in selective institutions for early identification of students needing special attention.

Watley (1966a, 1966b, 1966c, 1967, 1968a, 1968b) conducted a series of studies which explored the accuracy with which counselors can predict freshman overall GPA. Subjects were freshmen enrolled in the College of Science, Literature, and Arts at the University of Minnesota. The groups of counselors making the predictions included high school counselors, college advisors, and counseling psychologists from the University Student Counseling Bureau.

In the first study of the series, the author studied the predictive accuracy of different counselors. It was apparent that counselors varied greatly in their predictive skills. It was found that the counseling psychologists did a better job of predicting, as a group, than did the other two types of counselors. When the personality characteristics were examined, it appeared that those who predicted GPA best were more able to understand and to deal with abstract concepts. Furthermore, they were more compulsive and seemed to have stronger needs to develop knowledge of the constructs with which they worked.

There was evidence that the counselors in the low-accuracy group might be taught how to improve their predictive skills. A later study confirmed this possibility. Immediate feedback training substantially improved the predictive accuracy of low-accuracy judges while it had no noticeable effect on the judgments of high- or moderate-accuracy judges.

Another study in the series indicated that, in spite of the varied counseling styles noted, the style used was not found to be significantly related to predictive accuracy. Still another study indicated that the counselors who typically expressed the least confidence in their predictions of grades were as accurate as those who typically were highly confident about their predictions. When judging persistence rather than grades, the situation changed slightly. The degree of confidence expressed about "pass" predictions was significantly related to predictive accuracy, while the degree of confidence about "fail" predictions was not. "Fail" judgments tended to be more accurate than "pass" prognoses, however.

The amount of case data available was found to be negatively related to counselor predictive accuracy. In addition, judges were clearly unable to improve predictive accuracy by attempting to recognize when to deviate from the formula they were using.

Williamson and Cole (1966) hypothesized that instructors' evaluations of a student's academic progress depends as much or more on the student's social behavior than it does on his actual level of achievement. They examined this hypothesis at the secondary school level using 30 low-achieving and 30 high-achieving students matched on sex, grade level, and School and College Ability Test or Differential Aptitude Test scores. The subjects were 10th and 11th graders at a large Missouri high school.

Using the Behavior Differential (a list of 25 pairs of bipolar adjectives), the students rated themselves, they rated themselves as they thought their teachers saw them, and they rated themselves as they thought their peers saw them. All subjects were independently rated using the same instrument by two teachers familiar with the entire group, and the average in each case was the teacher rating used for the study. The teacher-rating mean score for each of the 25 scales differed in the expected direction in favor of the high-achieving student group. When *t* tests of mean differences were conducted, it became apparent that the teacher ratings differentiated the two achiever groups better than any of the student rating variables. Furthermore, when teacher-rating total scores were correlated with GPA for the combined group of students, a zero-order correlation of .79 was obtained.

Both low achievers' and high achievers' perceived teacher ratings were significantly different from the actual teacher ratings, but in opposite directions. Perceived teacher ratings were significantly lower than the actual teacher ratings for high achievers and significantly higher than the actual teacher ratings for low achievers.

Ratings of Others as Correlates of Grades, Persistence, and Academic Learning: Bibliography of Published Literature

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Interpersonal Relations

Interpersonal Relations as Correlates of Grades, Persistence, and Academic Learning: Selected Annotations

Austin, Lucas, and Montgomery (1968) studied freshmen living in the male and female residence halls at the University of Tennessee. A total of 734 pairs of roommates who roomed together during the entire year were identified. For each student, an ability score was obtained by computing a standard score that gave equal weight to American College Test (ACT) composite score and high school rank (HSR). Students were classified according to their academic ability, their roommate's ability, the degree to which they associated with their roommate, whether or not they requested a roommate, and sex. At the end of each quarter, each student completed a questionnaire which gave information about the degree he associated with his roommate. College grade point average (GPA) and persistence status were also collected for each quarter.

Withdrawal rates seemed much more affected by the variables studied than did GPAs. When all of the variables were considered simultaneously, which was necessary due to significant interactions, the following findings were noted: (a) Men who requested a roommate withdrew less and had a higher GPA than did those who did not make such a request. (b) Low-association women requesting roommates withdrew more frequently than did low-association nonrequesting women. (c) Men with roommates in a different ability category than their own withdrew more frequently than did roommates with the same ability. (d) For high ability men with low-ability roommates, those with high association withdrew more frequently than did those with low association. (e) For women with medium and high ability roommates, those with low association withdrew more often than did those with high association. (f) For men who requested their roommate, those with high association had higher GPAs than did those with low association. The author felt that in future research of this kind, assigned groups as well as roommates should be studied.

Bauer (1967) studied the the influence of student peer groups on academic development of undergraduates in a large state university. Data was collected by techniques usually employed in community studies — interviews, autobiographies, participant-observer reports, and information in university files and publications. Studies were completed of 35 campus organizations, housing units, cliques, and types of students; and particular attention was given to differences in the experiences of honors and regular student. The main objective of these studies was to relate social experiences to academic development.

Peer groups were weak in the academic sphere where the educational process primarily takes place. Because of this fact, typical students' relations with faculty and staff were marked by poor communication, lack of understanding, and conflict of values. Where peer groups were strong, as some were in the spheres of housing, organized activities, and social life, their primary function was socialization for a middle-class life, rather than academic learning. These strong peer groups operated at cross-purposes with the formal objectives of the university, and the university's support of fraternities and sororities and the emphasis on the grading system had the effect of strengthening the extra-educational objectives of students and families at the expense of the university's professed educational objectives.

Within this general condition of social fragmentation and cultural contradiction, however, there were some situations in which students formed close associations within the academic sphere, e.g., the honors students. For such groups, the pleasure of association in pursuit of knowledge tended to become translated into a liking for the content of the course and to the man who taught it. To the extent the man became a social group, it reinforced interest in the course and the motivation to learn. It became a catalytic agent in the learning process.

The findings suggesed that increased academic achievement will result from a close personal association in the academic setting of students with one another and with faculty. Furthermore, the emergence of stable, enduring groups within the academic sphere reinforces the learning process by linking it with gratifying interpersonal relationships.

Crew and Giblette (1965) compared the academic performance of freshman male roommates in required courses. The sample included the freshman male population at the University of Maryland for 1962. Using regression equations developed on data for this total sample (which used the American College Tests as predictors), predicted grades in each course were calculated for the pairs of roommates taking the course. Then *t* test comparisons on ability and grades were made for each course between the roommates in the course and all freshmen men taking the course. Following this, the difference between earned and predicted grades for the group of roommates was compared for each course using the Variance Ratio-F test. In addition, chi-square tests were used to test for significant differences in grade patterns among the residence halls.

Enough roommate pairs for statistical comparisons to be made were present in only three courses, English 1, Math 10, and Math 18, with sample sizes of 89, 56, and 26, respectively. The F ratio for the first two courses was significant at the .1 level while the F ratio for Math 18 was significant at the .005 level. In view of this limited evidence that the roommates' actual grades were higher than their predicted grades, it was concluded that proximity as a factor influencing academic performance among roommates is a tenable hypothesis. The findings seem sufficient to warrant the design and execution of an extensive study to verify these results.

Grinder (1966) studied the relationship of social dating attractions to GPA using a sample of 393 boys and 346 girls in grades 10-12. He used a social dating questionnaire consisting of four Likert-type scales, one for each of four social-dating incentive categories: sexual gratification, independence-assertion, status seeking, and participative eagerness. Additional data collected included responses to validity items (frequency of dating, age began dating, curfew hour, nights out per week, access to a car); academic items (grades received, hours spent studying, academic-degree aspiration); and peer relations (number of close friends, participation in high school activities, membership in cliques).

Using analysis of variance with the four scales of the questionnaire treated as the criterion and the personal information items employed as classification factors, a number of significant findings were noted for each sex. For example, GPA was negatively associated with interest in all four aspects of dating for boys and with sexual and independence-assertion for girls. Number of friends was significantly associated with boys' interest in all aspects of dating. Clique membership was reliably associated with status-seeking for both sexes and with the sexual aspect of dating for girls.

In order to study the effect of college roommates upon one another's grades, study habits, and other activities, *Hall and Willerman* (1963) experimentally formed dormitory roommate pairs with various combinations of academic ability as measured by high school rank (HSR). Students in two newly opened dormitories at the University of Minnesota were included in the study. The students in Dormitory A were male, mostly freshmen studying liberal arts, science, or engineering. The residents of Dormitory B were also largely freshmen, with male students in one wing and female students in another wing, and with an administrative office and a large lounge shared by the two wings. The males were majoring in agriculture while the females were majoring in home economics.

Mutual requests for particular roommates were honored, and these pairs of students constituted a separate group. A total of 192 other students became four different groups of roommate pairs according to four different conditions: High-HSR student with high-HSR roommate, high-HSR student with low-HSR roommate, low-HSR student with high-HSR roommate, and low-HSR student with low-HSR roommate. Within each group, upperclass students were matched with upperclass roommates and freshman students with freshman roommates. Each dormitory contained some of each category of roommates. Questionnaires, interviews, and administrative records were used to gather student information about study habits, the type of personal relationship between roommates, extra-curricular activities, and course grades.

Analysis of variance, analysis of covariance, and zero-order correlations constituted the statistical procedures used. The high-HSR roommates were generally regarded as being more desirable roommates, and pairs including high students were more likely to remain together as roommates. However, high roommates did not necessarily have an overall differential effect on the academic performance of their roommates when scores on the American Council on Education Psychological Examination were controlled.

The study results suggested that first-born students are more susceptible to influence and that later-born students are more influential. For example, students with high-HSR roommates obtained better grades than those with low-HSR roommates only if the roommate was later-born rather than first-born. Secondly, among males, first-borns profited more than later-borns from sharing courses with their roommates.

Concerning those students who chose each other as roommates instead of being experimentally assigned, the typical outcome was that they "sank or swam" together. Either both did better than expected or both did worse than expected.

MacKay (1965) attempted to relate interpersonal relationships to academic success. He gave the College Qualification Test (CQT) and the Student Opinion Survey (SOS) of the Inventory of Personal Opinions (IPO) to 427 males at a California junior college. An "integration level," the manner in which the person perceives his relationships to other people, was determined for each student; and distributions on this variable were related to persistence through the use of point biserial correlations. In addition, correlations with GPA were computed with CQT held constant. This was done separately for six different curricular areas and for students who were undecided about a major.

The correlation between integration level and persistence was low but positive and statistically significant. When the group was split into four quarters based on CQT ability, chi-square analysis revealed that the integration level-persistence relationship was higher at the upper and lower ends of the ability range. Only for technical students and general curriculum students was the correlation between integration level and GPA statistically significant where CQT was held constant. Therefore, it was concluded that maturity of interpersonal relationships was a more effective aid in predicting persistence than in predicting achievement. A final conclusion was that the interpersonal maturity model could be useful in integrating a wide variety of apparently unrelated findings.

Muma (1965) attempted to determine if academic performance is related to extremes in peer choice. The sample included 3,917 students in grades 7 through 12 in Tuscola County, Michigan. The students were divided into those who were highly accepted, those who were highly rejected, and those who were neglected. They were classified into these groups on the basis of a 10-item sociometric test developed for the experiment.

The mean of each student's final semester grades was converted to a 15-point scale, and the scores on this scale were used as the academic performance data (only basic academic courses were considered). An analysis of variance was run on the academic data and follow-up *t* tests of mean-pair differences were conducted. The results indicated that a relationship did exist and that academic performance was related to extremes in peer choice.

O'Shea (1969) conducted a review of the research relating peer relationships and male academic achievement, and his findings illustrate the importance of considering age and educational level, as well as sex and other variables like ability, when trying to integrate findings from various studies. Great confusion had seemed to abound from the research results reported in the literature. When this author categorized research results according to sample age level, he found that high achievers tended to be more socially active than did low achievers for students below college-age level. Just the opposite finding was noted for college-age students, with low achievers tending to be more socially active than were high achievers.

O'Shea suggested that longitudinal studies in this area need to be conducted. Only a longitudinal study can answer questions like the following: Do high achieving and socially achieving high school students become low achievers in college if they maintain their social activity? Do those who continue to achieve tend to become more introverted in college? If so, is the introversion a temporary expedient to insure continued high achievement so that social activity returns to its former high level when the student's educational goals are attained?

Shapiro and Voog (1969) tested the possibility that certain individuals have therapeutic qualities enabling them without training to facilitate others' functioning. The authors hypothesized that students communicating high levels of therapeutic behavior would influence their roommates to have relatively higher grades.

The sample for the study included all freshmen who had been assigned roommates at random in a dormitory for men at a large state university and who had not changed roommates by the end of the first semester (N=56). Dorm residents were rated for degree of therapeutic affectiveness by their roommates, the two freshmen living next door, and two dorm counselors, through use of the Personality Description form, a series of 7-point rating scales dealing with degrees of genuineness, empathy, warmth, evaluation, potency, and activity. This plus School and College Ability Test scores and GPAs were used in a two-by-two analysis of variance to test the possibility of a differential effect of roommates on GPA for students with high and low ability. The results suggested that students' therapy-like behavior was predictive of roommate's GPA according to ratings by the roommate and the next door neighbors, but not according to the ratings by the dorm counselor. An additional finding was that other factors in roommates which one might expect to affect GPA (aptitude and GPA) appeared to have no effect.

One of the assumptions in theories about the behavior of groups is that attraction to a group depends on the satisfaction of needs that membership in the group will provide. *Slocum* (1968) scheduled college students to take all their classes together in an attempt to determine what effect this would have on their attraction to a group and in turn on their academic achievement.

A total of 166 juniors attending the School of Business at the University of Washington were split into four groups, one the experimental group (N=42) where students were scheduled to take all classes (12 quarter hours) together for the academic quarter, and three control groups where students took three, four, or five hours together depending upon the courses determined by their advisor. To control for variance pertaining to teacher style, interaction patterns with students, and the type of examination given, each professor taught his course both to the experimental group and to one of the control groups. To allay the possibility that the students would give only socially desirable responses, the students were informed that several classes in the School of Business were chosen to fill out some questionnaires on student attitudes during the quarter, that this was one of the classes chosen, and that anonymity was promised. Also the professors knew nothing about the research being undertaken.

F-test comparisons on background data and Washington Pre-college Guidance Test Data affirmed that all four groups were representative of the common population from which they had been taken. A measure of group cohesiveness developed by Seashore and a questionnaire developed by Stoubber and his associates to describe the individual's adjustment to his environment provided the data for the experiment. From *t*-test comparisons made between the experimental group and each control group, it was determined (a) that students in the experimental group became more cohesive and (b) that students in the experimental group achieved higher grades in all three courses than did students in the control groups taking the same course. The hypotheses were confirmed.

Wallace (1967) attempted to determine the difference, if any, on grades students get and want to get as they come under the influence of teaching faculty or of fraternities. The sample included 1,005 undergraduates and 83 faculty members at a coeducational midwestern liberal arts college. The instruments used included a questionnaire and college records indicating the students' academic aptitude and achievement.

Faculty members put a higher value on grades than did fraternity members, and they also put a slightly higher emphasis on friendship. Fraternity members put the most emphasis on extracurricular activities and dating, and high-aptitude members generally had high grades and were apt to be satisfied with friends. Peer acceptance appeared to be related to underachievement for nonfraternity members and to high grades among able fraternity members. The high-aptitude fraternity members admired relatively few faculty members. Influences on academic achievement beyond individual aptitude definitely appeared to be exerted by components of the social structure.

Warwick (1964) designed a study to investigate the relationships of group cohesiveness and academic motivation (scholastic aspiration) to academic achievement among freshmen fraternity pledges and nonfraternity freshmen at Cornell University. All of the students in the study had been living in university dormitories since arriving at the university, and each floor of a dormitory had about 35 men and was a basic student governmental unit within itself. Concerning the 1,163 freshman men in the study, 736 of them were fraternity pledges representing 52 groups while 427 of them were independents representing 29 groups.

All subjects were administered Worell's Scholastic Aspiration Test and Brown's Instrument to determine the degree of scholastic aspiration and cohesiveness, respectively, existing for each of the 81 groups. For each fraternity group, a past-success index was developed to determine the relationship existing among the present academic achievement of a pledge class and the past academic performance of that fraternity. Other data collected (for all subjects) included first-term GPA, second term GPA, the discrepancy between first-term and second term GPA. Scholastic Aptitude Test (SAT) Verbal and Mathematics scores.

After ascertaining that the combined independents group and the combined fraternity pledges group were not significantly different on SAT scores, and after *t* tests had also been conducted on the other variables, these two groups were each split on the variables of concern. Then chi-square and sign-test analyses were conducted. Analysis of covariance, which adjusted for differences in first-term grade averages, was utilized to make comparisons among the 81 groups on the variables. The following results were noted: (a) The fraternity pledges had significantly higher first-term GPA means than did the independents, but there was very little difference between the two groups on second-term GPA. (b) The fraternity groups were more cohesive than were the independent groups. (c) No differences in scholastic aspiration between the fraternity and independent groups were noted. (d) All the evidence suggested that a high-cohesive group with either favorable aspiration or high past-success index scores does not do as well achievement-wise (with first-term grades held constant) as does the low-cohesive group with similarly favorable aspiration and/or past-success scores.

Wyer and Terrell (1965) designed a study to investigate the relationship between social role and academic achievement in college students. For a sample of 28 males and 28 females from a large class of sophomores at the University of Colorado, Scholastic Aptitude Test (SAT) scores and cumulative GPA were converted to z scores. The sample was classified into the following four groups on the basis of these academic aptitude and academic achievement scores: High ability-high achievement, high ability-low achievement, low ability-high achievement, low ability-low achievement. A modified form of the Goal Preference Inventory developed by Livesant was used to assess academic and social motivational characteristics for the students in three general areas: academic recognition, social recognition (social competence and admiration), and social love and affection (being valued as a friend). Using a 3-way analysis of variance design, with sex being the third dimension in addition to ability and achievement, group comparisons were made on the students' desires to receive social and academic recognition, the certainty of their occupational choice, their self-sufficiency or social independence, and their persistence or self-control.

Significant triple interactions of sex, academic achievement, and academic ability occurred for measures of certainty of occupational choice and desire to receive social recognition. In addition, there was a significant interaction between sex and academic achievement for the measure of self-control. Social group dependence was negatively related to academic achievement for men but not for women. The men-women differences on the variables relating to academic achievement were interpreted as resulting from the differences in prescribed social roles for these two groups of students.

Yourglich (1966) predicted that for a Catholic population in a Catholic University, dropouts can be differentiated from nondropouts by value orientations, social participation patterns, and friendship patterns. She theorized that the Catholic University is a complex social system composed of many subsystems which are interlocked to form the totality through shared values. As the occupants of positions and statuses in the various subsystems interact with each other, they feel the impact of each other's values, and reciprocal adaptations result. Those participants willing to make the adaptations remain in the social system, while those not willing to do so drop out.

Two weeks after arriving on campus, the entire group of fulltime, nontransfer freshman women living in a Seattle University dormitory (N=251) were administered the Allport-Vernon-Lindzey study of Values plus a questionnaire that asked for patterns of participation in on- and off-campus organizations, the number of friends on and off the campus, and the quality of friendships on and off the campus. By the end of the spring quarter only 15 of the women had dropped out, but comparisons were still made between this group and the 236 persisters. Analysis of variance and chi-square analyses were used to look at change and to make group comparisons.

Conclusions of the study were as follows: (a) That reduced significance of religious values and increased significance of social values differentiated the dropouts from the persisting students, (b) that the widening of friendships beyond the campus differentiated the dropouts from the persisters, (c) that a differential interest in participating in campus organizations distinguished the dropouts from the persisters, and (d) that the interpersonal interactions at a university are extremely important for developing values as well as for keeping students satisfied and willing to stay at the university.

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Chapter 7

BIOGRAPHICAL AND DEMOGRAPHIC CORRELATES OF ACADEMIC ACHIEVEMENT

Family socioeconomic level, including such parental characteristics as father's education and father's occupational level, have long been known to be related to persistence, grades, and learning. It is still of interest, however, to see the effect of different patterns of socioeconomic level and to see how socioeconomic level interacts with other predictor variables.

Family relationships during childhood and other family characteristics are also known to be important, but the relationships are not clear. The theories of Freud and others provide many testable hypotheses. The problem for research on college students is that much important data about the family may simply be inaccessible.

Interest in biographical inventories and college application blanks as predictors of academic success has been high ever since Anastasi and her associates validated such an instrument at the beginning of the decade of the sixties.[6] Another reason for the increased interest in data of this type (which includes data covered elsewhere in this chapter) is that such data are easily accessible to college officials and are commonly available for *all* freshmen prior to the time they enroll (which is when GPA and persistence predictions are most valuable).

Application Blanks and Biographical Questionnaires

Application Blanks and Biographical Questionnaires as Correlates of Grades, Persistence, and Academic Learning: Selected Annotations

Abe (1965) analyzed a section of the *American College Survey* completed by 3,770 male and 3,492 female college freshmen to determine whether or not nonintellective biographical information would be a valid predictor of academic achievement. He found concurrent validities ranging from .31 to

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[6] A. Anastasi, M. J. Meade, and A. A. Schneiders, *The validation of the biographical inventory as a predictor of college success: Development and validation of the scoring key* (New York: College Entrance Examination Board, 1960).

.50 for men and from .37 to .52 for women across nine criteria, results which are highly significant.

As a follow-up to the preceding study, and using the same sample of students, Abe (1966) factor analyzed selected items on students' attitudes, activities, interests, and experiences. Nine indices of academic accomplishment were used as criteria: scores on the four American College Tests, high school grades for the same four subject-matter area, and high school grade average. The criterion for item selection was that the items have a biserial correlation of at least ± .20 with one of the criteria and have been responded to by at least 5% of the sample. Eighty-seven items remained after this selection procedure. The principal components method of factor analysis, with varimax rotation, was used for the exploration. Factors with an eigen value greater than 1.00 were retained and rotated. Separate analyses for each sex were not performed because a measure was desired that would be applicable to both sexes.

Bloom and Peters' development of academic prediction scales (also at the beginning of the 1960s) heightened the interest in adjusting for high school characteristics when predicting student achievement.[7] They were able to increase the predictive efficiency of high school grades (when predicting college grade point average) a large amount by adjusting the students' high school averages according to the grading strictness at the high schools as indicated by college success of previous students from each high school. Just as is the case with colleges, some high schools are very strict in their grading practices while others grade quite leniently.

Other high school characteristics of interest include high school size and whether the school is public, private, or church-related. Additional demographic variables which have been explored are such things as geographic region of the country and whether the student's home is located in a rural or urban setting.

A total of 22 factors were retained and rotated. Five of these loaded on the indices of academic achievement, with the first factor being a largely verbal factor. It seemed clear from the results and the earlier item analyses that scales could be developed to predict English, mathematics, and natural science grades, but that no corresponding set of items could be formed to predict social science academic achievement. It was also concluded that more diverse measures of academic achievement are needed, and test measures constructed from biographical information may be especially helpful.

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[7] B. S. Bloom and F. R. Peters, *The use of academic prediction scales for counseling and selecting college entrants* (Glencoe, Ill.: Free Press of Glencoe, 1961).

Aiken (1964) studied responses on a biographical inventory for two groups of freshman women students (N=100 for both groups) at the University of North Carolina to determine possible relationships with attrition and academic success. Chi-square tests of independence for Group 1 between responses to 132 inventory sub-items and GPA levels yielded 26 chi-squares significant at the .05 level. The inventories for Group 2 were then scored using only the 26 sub-items determined using Group 1, and a score obtained for each student in that group. The biographical inventory scores along with high school rank (HSR), high school class size, and Scholastic Aptitude Test (SAT) scores were correlated with college grade-point average (GPA). Then all of these variables were used in a multiple-regression equation to predict GPA.

The biographical inventory scores had the highest zero-order correlation with GPA of all five predictors. The multiple correlation when biographical inventory items were included in the regression equation was .68, while without the inventory items the correlation dropped to .55. Thus, the biographical inventory contributed significantly to the prediction of first semester grades.

Flaugher and Rock (1969) studied over- and underachieving freshman college students using a multiple moderator technique. The sample included 1,075 freshmen at a large southwestern university, and it was divided into two groups for purposes of the study. Instruments used included a background inventory, an aptitude test battery, high school rank (HSR), and the Scholastic Aptitude Test (SAT). Five background scores were selected as likely moderators: student's education plans, father's education, size of home town, outside activities, and a measure of amount and breadth of high quality reading. The predictor variables were HSR, SAT Verbal, and SAT Math, and the criterion variable was freshman year GPA.

The two samples were independently run through a moderated regression program. Although several moderator groups from the first sample had indications of varying amounts of over- and underachievement, just two of the clusters also appeared for the replication sample: underachieving and overachieving. The overachievers tended to be of average aptitude, but their fathers were highly educated. The underachievers were mostly from small towns and indicated a high interest in extracurricular activities. The authors feel that further research in this area is needed so that generalized findings can emerge.

Hansmeier (1965) studied factors related to success for 294 students who had been readmitted to Michigan State University after having been dismissed because of low grades. Ninety of the men and 35 of the women were successful after readmission, but 123 of the men and 46 of the women were again unsuccessful. He found no significant factors differentiating the two groups, including sex, veteran status, and socioeconomic status. [Note: This study joins many similar studies in its lack of precision and uncertainty in determining success after readmission.]

Harrington (1969) attempted to explore the possibility of predicting college performance from biographical data. The sample included entering students at Ohio University for the fall semester of 1966, 746 men and 780 women. A 300-item biographical inventory was administered to the students and scored for two scales: creativity and management potential. In addition, the students had submitted scores for the American College Tests (ACT) at entrance, and also available for men were scores on the Academic Achievement scale of the Strong Vocational Interest Blank (SVIB).

Regression analysis indicated that the most useful predictors for grade-point averages after one semester for both men and women were the ACT math score, high school rank, and the creativity score of the biographical inventory. In addition, SVIB Academic Achievement contributed to the prediction of achievement for men, and the social science subtest of the ACT had some predictive value for women.

Six years after 459 freshmen had enrolled at North Texas State University, *Kooker and Bellamy* (1969) made comparisons between dropouts and graduates, using biographical information that had been collected on a questionnaire during the subjects' first month in school. The responses on each questionnaire item were classified into categories and chi-squares computed to determine if the responses were distributed differently for the two groups.

Factors discriminating the two groups included anticipated major (a greater percentage of graduates in education and of nongraduates in business administration, arts and sciences, and undecided); number of hours worked; anticipated grades; estimates of ability; extracurricular organization affiliations (more graduates affiliated), vocational goals; and college aspirations. In addition, mother's and father's educational level was related to the tendency to persist in college, athough parents' occupational level was not.

Lunneborg and Lunneborg (1966) and Lunneborg (1968) studied the differential prediction of college grades from biographic information for 526 freshmen at the University of Washington. Prediction was based on high school GPAs, college aptitude test battery scores, items from the college admissions application, the survey of college plans, and the Anastasi Biographical Inventory. A multiple correlation determined the best predictors with four course grades and overall GPA for the first study, and grades in 12 different course areas were the criteria for the second study.

The results indicated that biographic information of the kind easily available from admissions applications can effectively contribute to the prediction of academic performance. These studies further suggested the conclusion that while intellective measures contribute most to the absolute prediction of college grades, certain biographical measures contribute the most to differential prediction and thus have a place in prediction when the goal is maximum utility to the individual.

Magoon and Maxwell (1965) studied biographical differences between high- and low-achieving students based on college entrance information for 512 students at the University of Maryland. Two hundred and eighty-seven high achievers had GPAs of 3.5 or better, and 225 low achievers were on academic probation. Twenty-two selected demographic and psychometric variables were examined using chi-square tests of significance to see if any of them would differentiate the high achievers from the low achievers. Separate analyses were conducted for engineering males, arts and sciences males, arts and sciences females, and education females.

Two of the biographical variables significantly differentiated the engineering groups, eight differentiated the arts and science men groups, six differentiated the arts and science women groups, and twelve differentiated the groups of women majoring in education. It was apparent from the results that the characteristics related to high achievement vary according to the sex and the curricular major of the student. For example, some of the characteristics of high-achieving education females appeared to be related to failure for arts and science men, e.g., working part time, belonging to a fraternity or sorority, dating frequently, etc. Many of the differences found would undoubtedly have been masked if the samples studied had been representative only of the student body rather than of specific segments of the study body.

Prediger (1965) studied the contribution of biographical data to increasing the efficiency of predicting persistence in college over commonly used ability and achievement measures. His sample included 1,710 University of Missouri male persisters and dropouts over a 2-year period. These two groups were further classified into passing and failing groups on the basis of cumulative GPA. Results using a double cross-validation design showed that although the four groups could be differentiated significantly, predictions of group membership were found to be of little practical value.

In a later study, *Prediger* (1966) used a validation sample of 1,069 students to develop an empirical scoring key for the biographical inventory that would differentiate persisters from dropouts when the persisters and dropouts were matched as groups on three separate aptitude levels. The School and College Ability Test (SCAT) was the aptitude measure used. A fourth group of 400 students was utilized for cross-validating the keys.

It was found that persisters and dropouts unmatched in ability were differentiated about as well by the biographical data as by the SCAT and HSR data. Furthermore, within the ability levels, only the biographical data could generally differentiate the persisters from the dropouts. However, the point-biserial correlations were quite low for the low-ability group compared with the other two ability groups. Conversely, the HSR point-biserial correlation was statistically significant only at the low-ability level, and at this ability level it was slightly larger than the correlations for the biographical scales. Evidently, different factors operate in predicting persistence for low-ability students than for midde- and high-ability students.

Willingham (1965) made use of the entering 1960 Georgia Tech freshmen in order to examine application blank items for relationships to freshman grades or withdrawal. Each alternative of each statistically significant item was given a numerical weight according to how good a predictor this item was. This resulted in two sets of weighted items, one predictive of GPA and the other predictive of withdrawal.

The cross-validation sample consisted of all 1961 Georgia Tech freshmen. Using the previously calculated weights, two scores were computed for each student in the cross-validation sample: an achievement score and a persistence score. The achievement score predicted freshman grades with about the same accuracy as obtained using high school average ($\gamma = .48$) and made a significant, unique contribution to prediction when included in a multiple-regression equation that also included HSA, College Board Science Achievement, and College Board Math Achievement (Scholastic Aptitude Test Verbal and Mathematics did not add significantly to prediction in this equation). The persistence scale proved to be a relatively poor predictor (γ bis $= .25$) of students who voluntarily withdrew.

Most of the items found to be related to freshman GPA reflected "self-assurance" or "a willingness to work." Interestingly, the items relating to voluntary withdrawal were noticeably different. While the achievement items reflected current interests and behavior of the students, the withdrawal items were primarily background information.

Application Blanks and Biographical Questionnaires as Correlates of Grades, Persistence, and Academic Learning: Bibliography of Published Literature

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Parental Characteristics and Family Relations

Parental Characteristics and Family Relations as Correlates of Grades, Persistence, and Academic Learning: Selected Annotations

Carlsmith (1964) wished to determine the effect of father's absence during childhood on Scholastic-Apttiude Test (SAT) scores for college entrance. He gave a questionnaire on father absence to 450 Harvard 1964 freshman men and to the parents of 172 high school seniors (both boys and girls) in the area. Further, he obtained father's military service information through the medical history records filled out by 881 Harvard 1963 freshmen prior to matriculation. Students whose fathers were in the service but did not go overseas were eliminated from the sample. Also eliminated were foreign-born students and students from broken homes. A "SAT-Math minus SAT-Verbal" score was computed for each subject, and difference score comparisons made between the "fathers absent" and the "fathers not absent" groups with the independent variables being: (a) length of fathers absence and (b) age of the child when the father left home.

For 1964 Harvard freshmen, 20 students whose fathers went overseas before they were six months old and stayed away for at least two years were matched to 20 children of nonservice fathers on father's occupation, father's education, parents' marital status, and whether the student attended a public or private school. Except for the wartime separation, students in neither group had ever been separated from parents for more than two months during childhood and adolescence, and during the wartime separation of the experimental group no other adults became members of the household. For the experimental group, the SAT Verbal performance was found to be superior to SAT Math performance (as typically found with females) while the control group had better performance on SAT Math than SAT Verbal as typically found for males.

Next, 83 men in the 1964 freshman experimental group and also the high school mixed group were examined to see what effects different ages of occurrence and different lengths of separation had on the SAT difference scores. For males, if the father left early (before the son was 12 months old) and was gone for more than a year, the son's SAT-Verbal aptitude was relatively superior to his SAT-Math aptitude. However, both late and brief separation from the father were associated with a relative increase in SAT-Math ability. The same effect of father's absence on high school girls was noticed with both early and long separation from the father resulting in higher SAT-Verbal scores. Findings of the Harvard student replication sample supported the earlier findings and also indicated that absolute level of ability should be partialled out before trying to ascertain whether father separation resulted in a SAT-Verbal increase or a SAT-Math decrease.

Christopher (1967) had noted in counseling high school students that the strength of the parent-child relationship varies widely and seems to affect the cohesiveness of the family unit, which, in turn, is related to achievement motivation and scholastic performance. Therefore, he studied these variables for 384 tenth and eleventh grade students. Perceived strength of parent-child relationship was defined as the difference between parents as presently perceived and the ideal parent. The two other independent variables were perceived parental attitude toward achievement (scores on an academic attitude scale) and intelligence (scores on the Otis Test of Mental Ability). A three-by-three study design was used with each of the variables stratified into high, average, and low groups (with extreme groups including only persons one or more standard deviations from the mean). Analysis of variance was conducted on the data separately by sex.

There were marked differences in male and female achievement orientation and achievement relationships, with the findings for females conforming more to the predictions. There was a slight trend toward higher achievement in low-intelligence subjects for males who perceive their mothers as greatly different from the ideal parent. Just the opposite was true for average intelligence males; and for the high-ability males, higher achievement was associated with average mother-ideal discrepancies. For females, the closer to the ideal their mother was, the higher grades they tended to earn. There was a functional relationship for both males and females between perceived parental valuing of achievement and success in school.

The focus of a study by *Cottle* (1968) was on the "student's perceptions of their parents and themselves in transactional contexts, the emergence from these transactions of so-called masculine-feminine role constellations, and finally the effect of these phenomena on selected personality variables and overall school performance." The sample included 166 men and 84 women in the United States Navy who were engaged in a 16-week voluntary medical training program at a naval training center. Regression analysis was used to predict intelligence, aptitudes, and final course grades, with scores on the following instruments used as predictor variables: achievement value and personal control inventories, Taylor Manifest Anxiety Scale, self-concept measures, and a perception of family interaction inventory.

Grades appeared to be determined in part by each of the following: popularity, conscious preferences for feminine roles, unconscious male identifications, positive evaluations of self, intelligence, achievement value, and father's warmth. Popularity made the largest contribution to the prediction of grades, but father's warmth and mother's warmth, too, were involved in all of the other factors. Thus, the author concluded that perceptions of familial transactions are overwhelmingly important and stated the following: "Apparently what occurs is a relatively nonselective, sometimes idiosyncratic, sometimes stable concatenation of experiences, capable of being described by the individual, which is sculpted in the early years by a context of a family; that is, by a totality of family interactions. These experiences serve as a highly personalized medium out of which develop many of those characteristics like belief systems, esteem, and sexual identity, which ultimately take part in the formation of one's intelligence, aptitudes, and report cards. . . . The irony of the present results is that in the long run the most expedient predictors of school success may be precisely those measures modern educators now seek to replace; namely, intelligence tests and previously earned grades [pp. 882-883]."

Epps, Katz, and Axelson (1964) attempted to test the hypothesis for black students that having a working mother will mean greater academic achievement than having a nonworking mother. They paid 128 male Negro students at Florida A and M University $1.50 to volunteer for two sessions that totaled about 45 minutes in length. Part of Heineman's general anxiety questionnaire was administered at the first session, under different conditions for different segments of the group; and a modified form of the digit-symbol subtest of the Weschsler-Bellevue Intelligence Test for adults was administered during the second session. Other data for the study were gathered from student records at the college.

The working-mother and nonworking-mother subsamples were quite similar on general anxiety scores, rural-urban residence classification, size of high school class, number of broken homes, and father's occupation. Sons of working mothers had slightly, but not significantly, higher entrance examination total scores. Sons of working mothers had higher grade-point averages than did sons of nonworking mothers ($P < .06$) and worked harder initially on a digit-symbol task ($P < .05$) under test-instruction conditions. Sons of nonworking mothers improved more ($P < .05$) as the number of digit-symbol trials increased. The authors concluded their results supported the view that among southern Negro college students, sons of working mothers are more highly motivated for intellectual endeavor than are sons of nonworking mothers.

Heilbrun and Waters (1968) used 102 male undergraduate student volunteers at Emory University to test out a hypothesis suggested [illegible] an earlier study. The hypothesis was that males who perceive their mothers as having exerted strong control on them will differ in their academic performance according to the amount of perceived maternal nurturance affection and support with high-achieving students perceiving their mothers as exhibiting high nurturance and low-achieving students perceiving low nurturance in their mothers. Conversely, the hypothesis was that the achievement of males who perceive their mothers as allowing much autonomy will not differ in their academic achievement according to the amount of maternal nurturance perceived in their mothers.

The subjects were administered the Parent Attitude Research Instrument and some nurturance rating scales for measures of perceived control and nurturance, respectively. High achievers and low achievers were determined by students' predicted college GPA minus their obtained college GPA. Mean GPA discrepancies for the four control-nurturance groups were compared using *t* tests. Both hypotheses were supported by the results obtained.

Hollenbeck (1965) hypothesized that the five necessary and sufficient conditions listed by Carl Rogers for a therapy relationship to occur should also apply (in a modified form) to the family relationship in order for college-student adjustment and achievement to occur. The applicability of these conditions to student self-esteem and adjustment and to intellectual achievement was tested using 50 men and 50 women students from elementary psychology courses at the University of Wisconsin.

A slightly modified version of the Relationship Inventory was given twice (first with the mother as a referent and then with the father as a referent) to obtain parent-child relationship scores on unconditionality of regard, level of regard, congruence, emphatic understanding, and a total score (sum of the four parts). The criteria were (a) level of adjustment, as measured by the correlation between self and self-ideal Q-sort items and (b) first-semester freshman GPA with level of ability (as measured by the College Qualification Tests) partialled out.

Strong support was evidenced for the hypothesis that the conditions of student-parent relationship (except the condition of unconditionality) are related to students' self-esteem or adjustment. Furthermore, it appeared that the variables of the father relationship were more important than the mother relationship for both sons and daughters.

Only partial support was given for the second hypothesis, and it had to do with the father relationship. For the total group of students, significant correlations with adjusted GPA were found for level of regard, congruence, and total score in the father relationship. However, when sons and daughters were examined separately, only the men had significant correlations for emphatic understanding and congruence in the father relationship. Further evidence that different factors are important in the men-achievement and women-achievement relationship was that the correlation between self-ideal self Q-sort scores and adjusted GPA was .16 for men, —.31 for women (both significantly different from zero, but in opposite directions which resulted in a correlation of —.03 for the total group). This is another example of how important it is for educational researchers to conduct separate analyses for men and women.

Ornston (1969) attempted to find out why some skilled students do not appear to use their abilities. The sample included Yale students from the classes of 1965, 1966, and 1967. Weekly interviews over an unspecified period of time were held.

Two dominant patterns emerged indicating a shift in the student's position in the family constellation and conflicts about career commitment. Attitudes toward parental professions were ambivalent. Too much emotional closeness to one parent or a sudden discovery of too much similarity often created a need for distance from parental careers. Parents and students often had conflicting ambitions. Parental anxiety over factors unrelated to a son was most likely to be acted out by pressures on the son to commit himself to a career. Oddly enough, none of the students interviewed suggested the war or stress of modern life as relevant factors in their academic decline.

Shore and Leiman (1965) related parental perceptions, reported on an open-ended questionnaire, of junior college students to the academic achievement of groups of underachievers and achievers matched on intelligence and achievement feats. The sample consisted of 19 achieving and 20 underachieving freshman men of Leicester Junior College (a small 2-year college for men in Massachusetts). The Otis Quick-Scoring Mental Ability Test served as the intelligence measure. A questionnaire filled out by the parents prior to enrollment, which asked about their son and their expectations for him, provided the parental perception data.

The authors found significant chi-square differences ($P < .05$) between the groups in the parental descriptions of vocational goals and interests and of assets and liabilities for academic work in college. Parents of achievers saw specific goals requiring academic training while parents of underachievers saw indecision or goals requiring little academic training. Parents of achievers saw assets and liabilities in terms of academic abilities; parents of underachievers saw assets and liabilities in terms of personality traits and social ability.

It was clear that underachievers were learning at a level equivalent to achievers but because of certain difficulties were unable to produce or to achieve in the collegiate situation. The authors suggested that an important source of this difficulty may be parental expectations regarding academic achievement and degree of concern and interest in academic issues.

Teahan (1963) investigated child-rearing attitudes of college high- and low-achievers and their parents. The sample included 46 males and 44 females and their mothers and fathers. All the students graduated in the upper 20% of their class and one-half of them did poorly the first year of college. Instruments used included the College Qualification Test and parental attitude scales.

No differences were found in child-rearing attitudes of the students themselves. However, there were parent attitude differences, and the author suggested that insufficient development in self-sufficiency and independence could possibly handicap underachievers.

Compared with their daughters, the mothers of low-achieving women had stronger attitudes relating to domination and to the use of discipline. This mother-daughter attitude discrepancy was not noted for high-achieving females. The fathers had domineering attitudes for both female groups. However, fathers of the high-achieving girls agreed significantly more often than did the fathers of the low-achieving girls ($P < .05$) that "the most important consideration in planning the activities of the home should be the needs and interests of the child." In contrast to the females, the male underachievement seemed to be primarily related to disparaties between the attitudes of the father and son, with low-achievers' fathers having more possessive and dominating attitudes toward child rearing.

Warriner, Foster, and Trites (1966) studied "failure to complete" as a family characteristic. The sample included 1,089 male and 666 female freshmen at the University of Oklahoma. Amount of parents' education and students' American College Test Composite scores were obtained from school records. Statistical analysis was confined to graphic presentation of the data.

The authors found that college freshman males whose fathers and mothers had failed to complete educational undertakings more often voluntarily discontinued their education than did males whose parents had a record of completed educational undertakings. Level of academic aptitude did not appear to be an influential factor in this relationship. The females appeared to be similarly influenced by the amount of their fathers' education, but not by their mothers' education. For them, however, academic aptitude may be at least a partial cause of the relationship found.

Parental Characteristics and Family Relations as Correlates of Grades, Persistence, and Academic Learning: Bibliography of Published Literature

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Socioeconomic Level

Socioeconomic Levels as Correlates of Grades, Persistence, and Academic Learning: Selected Annotations

For 18,378 students randomly selected from those taking the American College Tests (ACT) in 1964-65, *Baird* (1967) related student-reported family income to ability; grades; nonacademic achievements; reasons for college choice; backgrounds; college goals; degree plans; expectations concerning college; and choice of major, vocation, and vocational role. Averages, percentages, and distributions were compared for students grouped according to different reported family income intervals. No tests of significance were applied to the data because of the large sample size which would have caused even very tiny differences to be significant and because it is often hazardous to use multiple comparisons on a set of data.

Students from low-income families, when compared with students from high-income families, had lower ability test scores. In spite of this finding, the low-income group had higher secondary school grade averages than did the high-income group. It should be remembered here that low-income students who aspire to attend college are probably not representative of low-income students in general who graduate from secondary school. They are probably a more select group than other students going to college because of college selection procedures and because many probably had difficult hurdles to cross which required real motivation in order to enroll at college.

Barger and Hall (1965) used socioeconomic background data and School and College Ability Test (SCAT) scores for 3,644 University of Florida freshmen and sophomores to explore the relationship between socioeconomic variables and college dropout when ability is controlled. The following variables served as predictors: parents' marital status, parents' income, father's education, father's occupation, student's religious preference, ordinal position, and family size. The sample was divided into high-, middle-, and low-ability groups of about equal size (on SCAT); and then for each ability level the students who failed to complete the year were compared with those who persisted, using chi-square analysis.

With the exception of parents' marital status, dropping out of college was not related to any of the socioeconomic variables studied, at any ability level. This was true for both men and women, and the parents' marital-status relationship applied only to the men and women in the upper-ability group. There was a strong relationship between some of the socioeconomic factors and ability, and it appeared that these relationships could be altered sharply by selection factors. In addition, it was noted that socioeconomic variables may have considerably different meaning psychologically for college men than for women.

Bradfield (1967) compared 36 low-income male work-study students at the University of North Dakota and Bismarck Junior College with a randomly selected control group matched on American College Test (ACT) Composite score, sex, college of attendance, and amount of previous schooling. The ACT Composite scores in each group ranged from 8 to 23, with a mean of 17 and a median of 20. None of the control students had applied for any kind of financial aid, a fact which led the author to assume that the group represented different family socioeconomic levels.

A battery of tests of personal characteristics important to college adjustment, success, and level of aspiration was given both groups at the beginning of the year and again at the end of the first semester. When comparisons were made between the two groups on the various personal characteristics, it was noted that the experimental group appeared quite similar to the picture of dropouts given by many studies of persistence. One semester of college seemed to accentuate these characteristics even more. Nevertheless, the low-income group had grades for the semester that were as good as or better than the control group. They also possessed levels of aspiration that were equal to those noted in the control group.

Cope (1966) wondered if psychological variables used by economists to study consumer behavior in the marketplace could also be useful in studying student persistence in college. His assumption was that educational consumption may be essentially the same as other forms of consumer investment, with attitudes, expectations, aspirations, opinions, and beliefs acting as intervening variables that help determine spending and saving patterns.

To stimulate interest in psychological dimensions that have received almost no attention by educational researchers and admissions officers, the author listed several hypotheses, e.g., (a) An individual with an achiever orientation is more likely to continue his education than is someone with a security orientation. (b) Students achieving access to educational opportunity from lower-economic groups are likely to be more continuing-education oriented than are students achieving the same opportunity from upper-income families. (c) Willingness to postpone gratification will foster proneness to stay in college. (d) An attitude of optimism is positively associated with continued college attendance.

Based on past research, social scientists had reached general agreement that, although socioeconomic class membership is a strong determinant of who will go to college, it is not a strong determinant of who will graduate. The reasoning given for this was that by the time he reaches college the low socioeconomic student has already overcome most of the handicaps provided by his home environment, and thus his ability becomes the crucial factor in whether or not he graduates. *Eckland* (1964a) questioned the validity of this commonly held assumption and conducted empirical research to test it. His research did not take into consideration the existing social composition diversity among colleges and universities but did take into account the "prolonged and sporadic careers of many students who *persist* in college and eventually graduate." The data were gathered as part of a larger study designed to trace the academic and social careers of students entering college ten years earlier.

A questionnaire was sent to 1,332 males who had entered a midwestern state university in September of 1952, and returns were received from 79% of the sample. Graduation data and other information were obtained from this document and from academic records provided by the university and the 104 institutions where many of the students had transferred.

When 2 X 2 statistical tests were conducted, four of the social class indices (socioeconomic status, father's occupation, parents' education, and parents' assumption children would go to college) were significantly related to graduation in four years, graduation after continuous attendance, and all graduates (including those who dropped out and later returned). The other two social class variables, family income and who pays for college, were significantly related to the first two criteria of persistence but not to the last. In addition, four of the six indices were significantly related to returning the sophomore year.

These relationships were especially true for those who were only average students in high school. Rather than economic or intellectual factors, the link between the independent variables and the criteria appeared to be the "psychocultural dimension" of class. An additional finding was that the total socioeconomic status index was a better predictor of graduation than were the separate indicators.

Petrik (1967) attempted to determine if validity of the Strong Vocational Interest Blank (SVIB) for predicting persistence in selected college curricula varies with the socioeconomic status (SES) of the sample. The sample included 722 male freshmen enrolled in prebusiness, engineering, prelaw, or premedicine at the University of Minnesota. In addition to the SVIB, the Occupational Rating Guide and the Minnesota Scholastic Aptitude Test (MSAT) were used.

A *t* test was utilized to test differences in mean scores on each SVIB scale, on MSAT, and on the SES measure, where it was appropriate, between persisting and nonpersisting students. Results indicated that the prediction of persistence was more accurate for lower-class subjects than for middle-class and prebusiness and prelaw subjects. The results suggest some sort of relationship between the findings of this study and those of a 1954 study by McArthur, who found the SVIB more predictive for middle-class than for upper-class males.

Sewell and Shah (1967) used data from a large statewide study to explore the effects of socioeconomic level on graduation from college. In 1957 a questionnaire survey of all high school seniors in Wisconsin had been conducted; and in 1964 a follow-up study of about one-third of that group was initiated, utilizing a mailed questionnaire and telephone calls to the parents. By these methods, 91.1% of the parents were reached, and 95.8% of the parents reached gave the required data about their sons and daughters.

The socioeconomic status variable was based on a weighted combination of father's occupation, father's formal educational level, mother's formal educational level, an estimate of the funds the family could provide if the student were to attend college, the degree of sacrifice this would entail for the family, and the approximate wealth and income status of the family. The sample was divided into high, upper-middle, lower-middle, and lower socioeconomic-status groups, and one of the variables upon which group-percentage comparisons were made in the follow-up study was graduation status. When only those who attended college were included in the analysis, intelligence was more important than was socioeconomic status, for both sexes, in determining who eventually graduated from college. But socioeconomic status continued to influence college graduation, even after socioeconomic selection had played its part in determining who would attend college.

Woods, Jacobson, and Netsky (1967) studied the relationship of social class to Medical College Admission Test (MCAT) scores and medical school groups for 75 end-of-year sophomore medical students at the University of Virginia. The criterion grades included cumulative GPA and scores on National Board tests given as final exams in anatomy and pharmacology. Each student's social class was determined by his responses to seven items of a 52-item biographical inventory.

The students were ranked according to social class and those in the top quarter compared with those in the bottom quarter on the other variables of concern using *t* tests of mean differences. The students were also ranked on the other variables and social class distribution for students in the upper quarter and the lower quarter compared. Both methods produced similar results. Social class was significantly related to scores on the two National Board tests and to scores on some of the subtests of the MCAT (notably Verbal Ability). However, a significant relationship between social class and cumulative GPA was not found.

Wright (1966) studied the effect of family economic level on the relationship between self-concept, reported environmental and/or personal stress, and academic achievement. It seemed to this researcher that students in lower and higher economic levels would perceive themselves and their environments differently, would have differing motivations for academic achievement, and would use different means of maintaining or improving their self-concept.

Bill's Index of Adjustment and Values self-concept scores and Activity and Personal Stress scores were collected for 350 undergraduate students along with information such as family income and GPA. The sample was split into five income levels, and correlations with GPA were computed at each level. From the results it is evident that the relationship between self or environmental factors and achievement can vary as a function of demographic variables. For example, a diametrically opposite relationship was found to exist between self-concept and academic achievement for the lower versus the higher income groups. Similar controls are suggested for investigating such factors as religion, ordinal position in the family, ethnic groups, or place of residence.

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High School and Geographic Factors

High School and Geographic Factors as Correlates of Grades, Persistence, and Academic Learning: Selected Annotations

In a study of Negro male undergraduates at a large midwestern state university, *Bindman* (1966) found that the Negro students were less adequately prepared for college-level work than were their white counterparts. He wished to know whether this resulted from differences in the degree of integration in the high schools from which the students came, their socioeconomic backgroud, their high school ranks, or racial discrimination. Ability tests and academic level were obtained from university records while the degree of high school integration (85-100% Negro, 50-85% Negro, 25-50% Negro, 1-25% Negro) was obtained in interviews.

Chi-square analysis was the statistical method used to make group comparisons. The differences in degree of integration at the students' high schools did *not* distinguish the more academically prepared from the less academically prepared students. The same was true for socioeconomic background and high school rank.

Butzow and Williams (1967) referred to an earlier study by Hill, in which, after socioeconomic level and aptitude were controlled, it was found that public high school graduates earned better grades than did graduates from private high schools. They wondered if this would be the finding if the private school graduates were Catholic high school graduates rather than graduates of private schools in general.

Using samples of students from Nazareth College of Rochester (a Catholic institution) and considering the effect of aptitude (SAT scores) and socioeconomic level, a group of 66 public school graduates was compared with a group of Catholic school graduates on first semester and first year college GPA. The two groups seemed to do equally well at this Catholic college. No attempt was made to make such comparisons at other types of colleges and universities.

Creaser (1965) reasoned that college students who earned low grades at a strict-grading high school will probably earn just as good or better grades at college than high-ranking students from lenient-grading high schools. It follows that discrepancies in high school grading practices will lower GPA predictability unless such discrepancies are accounted for in the GPA validity study. Therefore, the author devised such a method and tested it out using 1,833 University of Illinois freshmen who graduated from 12 different high schools.

Before being analyzed, the high school rank (HSR) data were transformed to stem scores (standard scores with a base of ten) in order to approximate the normal distribution desired for correlational work. Then the correlation between HSR stem score and college grades was computed separately for the students from each high school with the correlations ranging from .71 to .33. A predicted college GPA was also computed for each rank for each high school, and the equating of ranks accomplished for each student by substituting the predicted college grades for his high school which corresponded to his high school rank. Conversion tables can be used to make the adjustments, or conversion parameters for each high school can be programmed into the computer doing the predicting. After the HSRs for the students in the study were converted, it was found that the correlation with college GPA increased from .47 to .61 ($P < .001$). When the same adjustment weights were applied to a cross-validation sample ($N = 1,310$), the correlation change there was from .43 to .57 ($P < .001$).

In a similar study using the Bloom and Peters (1961) method of adjusting for high school grading differences, *Birnbaum* (1965) developed HSR conversion weights using 213 students from 35 high schools at the State University of New York at Stoney Brook. The college-GPA predictive correlation improved from .32 to .57 after HSR adjustments had been made ($P < .001$). For a cross-validation sample, HSR adjustments increased the predictive validity from .20 to .38 ($P < .05$). For the original sample, multiple correlations based on HSR and SAT-Verbal scores as predictors were .44 when absorbed HSRs were used and .64 when adjusted HSRs were used in a regression equation.

Finger and Schlesser (1963) wished to find out why public high school graduates obtain higher college grades than did private school graduates, even when aptitude is held constant. They hypothesized that public school students do better in college because they are more rigorously selected for admission, which means that they would be expected to have higher motivation than the private high school graduates have as well as higher aptitudes.

The subjects in the study were 313 Colgate University students, 216 who had attended public high schools and 97 who had attended private high schools. Analysis of covariance was used to compare means, equating the two groups on both aptitude (Scholastic Aptitude Test scores and Ohio State Psychological Examination scores) and motivation (scores on the Personal Values Inventory). When both aptitude and motivation were held constant, it was discovered that the college GPA means for the two groups did not differ significantly. A chi-square analysis procedure yielded the same finding. Cross validation on another sample of students also gave the same results.

Hood (1967) studied achievement in various types of colleges for the Minnesota statewide population of college freshmen from farm backgrounds. He compared mean differences (separately for males and females) between farm and nonfarm students at eight different types of colleges on the following three variables: College GPA, high school rank (HSR), and Minnesota Scholastic Aptitude Test (MSAT). Then zero-order and multiple correlations with HSR and MSAT as predictors and GPA as the criterion were computed separately by sex for farm youth and total freshmen at each type of college.

As a group, the farm students had lower MSAT scores. Yet they had higher HSRs and higher college GPAs than did nonfarm youth. Patterns of academic achievement among farm students did not differ for most of the types of colleges studied. The exception was at the state university where students from farm backgrounds overachieved in the College of Agriculture, achieved as would be expected in the Institute of Technology, and underachieved in the College of Liberal Arts.

An earlier study by Bloom and Peters had suggested that colleges should adjust for high school size and location in predicting college grades.[1] Therefore, *Lindquist* (1963) tested out what "is presumably the theoretically best possible 'internal' method of scaling high school grades to improve the prediction of college grades." A total of 16,650 students at 60 colleges who came in groups of ten or more from 608 high schools constituted the sample.

Adjusting the high school grades with this scaling procedure did result in a larger multiple correlation when used with American College Test (ACT) scores to predict college GPA. However, the small increase in validity resulting from such a procedure was not considered to be worth the effort. The median scaled-HS-grades-plus-ACT correlation of .691 was about the same as the median observed-HS-grades-plus-ACT correlation of .681.

Morse (1966) investigated the frequently-made assertion that a total high school record is not as revealing as the last year or two of high school when it comes to predicting college GPA. The sample for the study was composed of first-time freshmen at Eastern Michigan University who came from nine large high schools (N = 405). For each of these students, the following GPA information was collected: GPA for the ninth and tenth grades, GPA for the eleventh and twelfth grades, total high school GPA, and first semester college GPA. The sample was divided into the following three groups: Late Bloomers (GPA 11-12 at least .5 greater than GPA 9-10), Early Bloomers (GPA 9-10 at least .5 greater than GPA 11-12), and Steady Students (the remaining students). The college GPA means for the three groups were then compared using analysis of covariance, controlling for high school GPA.

The Late Bloomers had higher adjusted college GPAs than did the Early Bloomers, but the Steady Students were the best achievers in college. Furthermore, GPA of Late Bloomers had more accurate GPA predictions (although not statistically significant) when total high school GPA was the predictor than when GPA 11-12 was the predictor. The author concluded that college grade prediction can be improved by utilizing both the pattern and the level of high school achievement.

Ruch (1968) examined the effects of the Advanced Placement (AP) Program at one high school by comparing the freshman college records of students who participated in the AP program with college records of students of similar ability who attended the same college or university but who did not take the AP class in high school. Out of 862 members of the graduating class at this high school, 15 pairs of AP-nonAP students were found that could be matched on college attended, high school class rank, SAT scores, and senior-year curriculum. Six more pairs were added who were matched on all variables except senior-year curriculum.

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[1] B. S. Bloom and F. R. Peters, *The use of academic prediction scales for counseling and selecting college students* (Glencoe, Ill.: The Free Press of Glencoe, 1961).

Chi-square analysis revealed that AP students were more inclined to continue in their subject area when reaching college. However, nonsignificant sign test differences suggested that the AP students did not earn higher freshman grades in the subject than the non-AP students who continued in the subject area in college. Similar nonsignificant findings were noted when the two groups were compared on first-year cumulative GPA using the Wilcox Sign Rank Test.

Watkins and Levine (1969) conducted a pilot study involving 7 colleges and 45 secondary schools plus an operational-feasibility study involving [illegible] colleges and 186 high schools to explore the increase in predictive efficiency obtained by adjusting high school rank and other high school achievement measures using two different methods. They adjusted according to differences in high school Scholastic Aptitude Test (SAT) level and also according to college grades received by each high school's students (so that the adjusted high school grade mean was always equal to the college freshman grade mean for students from each high school).

When the adjusted high school ranks and grades were used along with SAT scores to predict college grades, almost no improvement in predictive efficiency was obtained by either method in either study over that obtained by using observed high school data and SAT scores. It was concluded that going to complex and expensive high school grade adjustment systems on a large scale was definitely not warranted.

Watley (1964b) added type, location, and size of high school data to other cognitive instruments in predicting success of 1,101 freshman males at the University of Minnesota Institute of Technology. He found greater predictive accuracy for urban and private groups than for the suburban group

As a result of Watley's finding, *Watley and Merwin* (1967) attempted to improve predictions of college success as measured by first quarter grades GPA through adjusting academic predictor variables (high school rank and Minnesota Scholastic Aptitude Test) for location of the high school (metropolitan, suburban, and other) and the size of its graduating class. Their sample included 3,792 males and 2,083 females in three different colleges of the University of Minnesota.

The authors used a double cross-validation design and found that the overall predictive efficiency was not significantly improved. They did find some evidence that HSR predicts with differential efficiency for subgroups within a college sample, but these subgroups were too small to significantly affect the validity correlations for an entire college sample.

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Chapter 8

COLLEGE ENVIRONMENTAL AND SPECIAL PROGRAM CORRELATES OF ACADEMIC ACHIEVEMENT

Several widely known instruments have been developed to measure the general college environment perceived by the students, e.g., Astin's Environmental Assessment Technique, Pace's College and University Environment Scales, and Stern's College Characteristics Index. Some studies have attempted to relate academic success to scores on such instruments. Others have used interviews and open-ended questionnaires to find out the perceptions of the students concerning various aspects of their college environments.

Some of the studies have focused on only one aspect of the college environment. These include studies exploring the relationship to academic success of student's place of residence while a student, classroom and laboratory facilities, teaching methods and media, teacher behaviors, etc.

Studies of environmental correlates and predictors of academic success are covered in the first section of this chapter. The second section covers studies that have explored the effects of counseling, and other college special programs, on academic success. Special programs include such things as special dormitory arrangements, special honors programs, special orientation projects, experimental projects, and other special out-of-class innovative efforts.

In addition to experimental programs within an institution, there have been a number of institution-wide experiments at colleges referred to as "experimental colleges." Oftentimes these have been new colleges, but there have been cases where innovation and experimental change have permeated an old, established institution so thoroughly that it has become classified as one of the experimental colleges. Evaluation research at such colleges has tended to focus on nonintellective impacts rather than on intellective impacts.

College Environmental Factors

College Environmental Factors as Correlates of Grades, Persistence, and Academic Learning: Selected Annotations

Astin (1968) explored the relationships between student achievement and the traditional indices of institutional quality with differential student inputs being controlled. A sample of 669 students was drawn from a larger sample comprising the freshman classes entering a stratified national sample of 248 four-year colleges and universities in the fall of 1961. Student input (control) information available totaled 103 variables and included aptitude (scores on the National Merit Scholarship Qualifying Test), sex, high school grades, size of high school class, father's education and occupation, educational aspiration, intended major, intended occupation, etc. In addition to a large number of institutional characteristics included in the analysis for exploratory purposes, eight measures of "institutional quality" were included: selectivity, per-student expenditures for educational and general purposes, number of books in the library, books in the library per student, faculty-student ratio, percentage of faculty with Ph.D., total affluence, and degree of competition for grades perceived by the student body. The student output (criterion) measures were scores on the area tests of the Graduate Record Examination (GRE).

The statistical technique was a 3-stage, stepwise, linear-regression analysis, in which the dependent variable was students' scores on one of the GRE area tests. During the first stage of each analysis, the 103 student-input (control) variables were entered into the equation. During the second stage the 69 college environment variables were permitted to enter the equation, and during the final stage two interactive terms were entered. Three such three-stage analyses were performed, one for each of the GRE area tests: Social Science, Humanities, and Natural Science.

From the study results it would appear that the traditional indices of institutional quality do not contribute to student academic achievement in social science, humanities, or natural science. Similarly, the evidence did not support the contention that the bright student benefits more than does the average student from exposure to these assumed indices of institutional quality. In addition, indications are that differences in student achievement during the senior year in college are much more dependent upon the variations in student characteristics at college entrance than they are upon any characteristics of the college attended.

Astin (1969) presented data from the cooperative institutional research program of the American Council on Education, at that time involving almost one million students from more than 400 colleges. These data had been used to study the effects of institutional prestige on student development. The average ability of the freshman class at these schools had a greater effect on grades and dropping-out than did any other institutional characteristic studied. Selectivity appeared to have a negative effect on the freshman grades, but a smaller percentage of the students at the highly selective colleges dropped out than was the case for the less selective colleges. The author emphasized that "a given student is more likely to drop out if he attends a relatively unselective college than if he attends a very selective one, even though his freshman GPA is likely to be higher at the unselective college."

Bradshaw and Kahoe (1967) studied the differential effects of fraternity and sorority membership upon scholastic achievement for students at Ohio University, who demonstrated academic promise during their freshman year. For a group of 268 freshmen who had been initiated into national scholastic honor societies after their first semester, 93 were initiated into fraternities and sororities during the second semester. Those students were compared on GPA (at various points throughout the four years) with those students in the group not joining a fraternity or sorority, with controls being carried out for aptitude scores on the Ohio State University Psychological Examination, age at the time of matriculation, and the college in which they were majoring.

For men, the grades of fraternity members declined from a significantly higher mean GPA the first semester to a significantly lower GPA the second semester. The nonfraternity men maintained a statistically significant GPA superiority for most of the remaining semesters of the four years. There was no significant difference between the GPAs of the sorority and nonsorority women for any semester during the 4 years.

Hoyt (1968b) attempted to develop valid generalized regression weights and regression constants which will validly predict American College Test (ACT) Composite, high school average (HSA), and first-year GPA means for every 4-year college in the country. Such an equation for predicting GPA must take into account the college grading practices and the academic promise of the students.

The sample included 50 4-year colleges which were participants in the American College Testing Program Standard Research Service for the years 1965-1966. Each college reported first-year grades for its freshman class and received separate research reports for men and women students. ACT Composite, HSA, and GPA were intercorrelated and regression weights for the first two variables computed for each college. The medians of these values became the regression weights for the generalized equation. The regression constants were estimated by using the factor scores for college characteristics developed by Astin to predict mean ACT Composite, mean HSA, and mean college GPA for 167 colleges. The resulting generalized equations proved to be about as accurate as the ones developed individually and tailored for each college (.78 for mean ACT Composite, .58 for mean HSA, and .59 for mean college GPA).

Using data from colleges participating in the 1967 ACT Basic and Standard Research Services, the equations were tried out for a new sample of 204 colleges. The correlation between predicted mean and actual mean was .78 for ACT Composite, .63 for HSA, and .54 for GPA. Still another validation was attempted using data for 53 colleges published in the College Entrance Examination Board's (CEEB) Manual of Freshman Class Profiles. Although it ranked ordered ACT Composite means (as transformed from SAT using Chase and Barritt's Table of Concordance) with acceptable accuracy it was evident that for the CEEB affiliated colleges the equation was underestimating ACT Composite mean.

Lauterbach and Vielhaber (1966) had half of an entering class at the United States Army Academy (N = 383) describe West Point on the College Characteristics Index (CCI) as they expected it to be (expectations profile) and the remainder of the class (N = 387) describe it as they preferred it to be (needs profile). The individual CCI profiles for each group were compared with the mean profile for 646 cadets who had completed the CCI halfway through their freshman year (press profile), and the difference indices were correlated with end-of-freshman- and end-of-junior-year GPA.

As expected, the closer a student's profiles were to the press profile, the greater his academic achievement tended to be. In other words, chances of excelling in academic performance were slightly improved if a student had insight into the freshman year environmental press.

Contrary to the authors' hypothesis, the more congruent were students' need profiles with the press profiles, the less academic success they tended to experience. In order to ascertain possible reasons for this finding, the expectation-press indices were correlated with eight "well-explored" West Point selector variables: High school rank, high school extracurricular activities, Scholastic Aptitude Test (SAT) Verbal and Mathematics Scores, a composite of the five variables that best predicted cadet academic achievement (CEER), College Entrance Examination Board (CEEB) Mathematics Achievement, CEEB English Composition, and physical aptitude. The need-press indices correlated negatively with SAT-V, SAT-Q, and EER, but negligibly with the other five variables. Thus, need-press appeared to be a function of cognitive factors, but how cognitive factors operate in incoming cadets' expression of their preferences relative to the actual West Point environment was not clear.

McKeachie et al. (1966) hypothesized that the grades of students high in affiliation motivation will be relatively higher in classes where the instructor provides many affiliative cues (cues of friendliness) than in classes low in affiliative cues. Exactly the opposite interaction between grades and environment was hypothesized for students low in affiliation motivation.

To test these hypotheses, the authors chose three multisection courses at the University of Michigan that represented quite different types of content and objectives: second-year French, freshman mathematics, and general psychology. Thirty-one instructors participated, all of them experienced teachers in these courses. Thematic Apperception Test responses provided the measure of student need for affiliation. Class means of student reactions to three items in a 12-item questionnaire provided the measure of level of instructor affiliation cues for each class. Course grades served as the criterion. The procedures were replicated in a second study involving 24 introductory psychology teachers. In a third study using 16 introductory psychology teachers, everything was the same except classroom observers rated the overall level of affiliation cues. The hypotheses were confirmed in all three studies.

Nelson (1966) attempted to determine whether institutions having low freshman dropout rates differed from those with higher rates with respect to 22 institutional variables that were available for analysis. Data for these variables were obtained from college directories and catalogs and included such things as cost, sex composition of the student body, size, pragmatism, etc. The sample included 100 4-year colleges across the country with the dropout rate between 0 and 5% and 100 4-year colleges with a higher dropout rate, between 6 and 47%.

Chi-square and *t* tests were used to determine whether there were statistically significant differences between the two groups of schools concerning institutional characteristics. Colleges with low dropout rates differed on 15 of the 22 characteristics. Ten of these characteristics were related to student factors while the other five were nonpersonal, including such items as size of school. The author believes that to understand attrition we must take into account both personal and nonpersonal factors.

Prusok and Walsh (1964) explored the relationships between freshman students' first-semester GPA and their residential environment. The men in the 1961-62 freshman class at the University of Iowa were split into four residence groups: fraternities, residence halls, living at home, off-campus. Then GPA means were compared for the four groups, with ability (American College Test Composite Scores) held constant, using analysis of covariance. The differences between the adjusted GPA means were nonsignificant. Similar analyses indicated no differences in adjusted GPA means among the 19 fraternity pledge classes (although there were large differences between pairs of groups at opposite extremes on the adjusted GPA mean distribution) or among pledge classes reporting "good," "mediocre," and "poor" fraternity scholarship programs.

Robinson (1969) tried to relate students' perceptions, attitudes, and judgments of selected aspects of the University of Illinois environment to persisting, withdrawing, or being forced to drop out within eight semesters after entrance. The sample included 2,800 University of Illinois second semester freshmen. The only information used was the Student Information Form which was a questionnaire asking students to indicate their degree of satisfaction with certain aspects of the University. The questionnaire consists of ten academic items and ten nonacademic items. Seven factors accounted for approximately one-half of the variance in student responses, and scores on these factors constituted the independent variables for the study.

Eight semesters after entry, students were classified into one of three status groups: persisted (N = 932), withdrawn (N = 255), and dropped (N = 575). A two-by-three analysis of variance factorial design was used with a one-way multivariate analysis being performed separately for each sex (since males and females were not distributed proportionately among the status groups).

Students' evaluations of the college environment were not independent of status. Both male and female students who were dropped or withdrew had varying evaluations about the selected academic and nonacademic aspects of their environment. The results indicated that students' evaluation of environmental factors can be important in forecasting future persistence status.

Schurdak (1967) developed and evaluated an approach to the use of computers in instruction. This approach allowed the students to communicate with the computing system, where the course material was stored, interactively through a keyboard terminal. Although it was still relatively primitive and simplistic, it was believed that his method could compete favorably with other accepted forms of instructional aids.

The subjects were 48 graduate and undergraduate students taking a computer programming course in the summer session at Columbia University. The students were divided into three experimental treatment groups of 16 each, with the first group scheduled to learn the required material by use of a computer, the second by use of a programmed textbook, and the third by use of a conventional textbook. Analysis of covariance, which controlled for student aptitude (scores on the Henmon-Nelson Tests of Mental Ability), were used to compare learning as evidenced by scores on interim comprehension and diagnostic tests and a final overall achievement test at the end of the course. The students in the computer-treatment group significantly outperformed both of the other groups on the criterion measures. In addition, it was noted that the computer effectively made considerable adjustments to individual differences in ability to learn the material.

Solomon, Bezdek, and Rosenberg (1963) studied teaching styles and behaviors and their relationships to learning. Teachers and students for 24 introductory American government evening courses at 13 midwestern colleges and universities made up the sample for the study. Data-gathering devices on teacher styles and behaviors included a 38-item teacher behavior rating scale completed by trained classroom observers (completed once during each of the five visits that took place to every classroom during the semester), tape recordings of five classroom sessions, and a 60-item student questionnaire about teacher behavior which was given near the end of the semester. A pre-post administration of a multiple-choice test on factual information (Part 1 — 35 items) and students' comprehension of a difficult reading passage (Part 2 — 10 items) provided difference-score measures of the amount of learning achieved.

Data for a total of 169 teacher-behavior items were factor analyzed to get eight bi-polar factors. The relationships between these teaching-style elements and students' learning were then explored (a) to see if there were linear relationships, by computing correlations between teacher scores on each factor and class learning means; (b) to see if there were nonlinear relationships by chi-square analysis of individual student learning with teachers divided into upper, middle, and lower thirds by their scores on each factor; and (c) to see if there were interactions between teachers' factor scores and certain student and classroom characteristics that affected student learning, by using analysis of variance.

A number of significant relationships were noted. Gains in factual information were associated with the teacher factor on clarity or expressiveness and with the teacher factor on lecturing. Gains in comprehension, on the other hand, were associated with a moderate position on the permissiveness versus control factor and with three factors dealing with energy, aggressiveness, and flamboyance, respectively.

Concerning the effect on learning of interactions between teacher behaviors and individual and environmental characteristics, there were no significant relationships for comprehension. For factual learning, however, several were noted. Students with jobs did best with relatively aggressive teachers who emphasized students' factual participation. Women did best in classes of teachers scoring high on the "lecturing" dimension. Students below the age of 19 learned most from teachers who emphasized student growth while students 19 or over learned most from teachers emphasizing factual participation. Students in large classes learned best from permissive, warm, and flamboyant teachers who emphasized student growth while students in small classes learned best from relatively dry teachers who lectured and emphasized student factual participation. In large classes student social interaction was less and the effective teacher took upon himself some of those functions.

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Counseling and Special Programs

Counseling and Special Programs as Correlates of Grades, Persistence, and Academic Learning: Selected Annotations

Brown (1969) wondered if there would be an interaction effect on grade improvement between the amount of structure in a group counseling setting and the amount of anxiety exhibited by college underachievers. A total of 42 students, the 21 highest and the 21 lowest on a Manifest Anxiety Scale that had been developed by Bendig, were selected from 129 second semester freshmen who were on academic probation at Loyola University and were required to take a college skills course. Each anxiety group was split into three treatment groups: an unstructured counseling group, a structured counseling group, and a college skills class group. The result was six treatment groups of seven students each. The two college skills class groups were teacher-centered and lecture-oriented while the two structured counseling groups were counselor-centered with the counselor suggesting topics, directing questions to class members, and leading discussions. In the two unstructured counseling groups the counselor only suggested topics.

A treatment X levels analysis of variance design was used to explore the group differences. The research hypothesis that there would be significant observed interaction effects between level of anxiety and degree of structure in the treatments was supported for GPA and on scales measuring anxiety, attitude toward others, and willingness to accept limitations. The high-anxious students benefited most from an unstructured group experience while the low-anxious students benefited most from a structured group experience.

DeCoster (1966) related housing assignments to grades for over 200 students at the University of Florida. Students were divided into four groups: a) average students living with a concentration of high-ability students, b) average students randomly assigned to residence halls, c) high-ability students living with a concentration of high-ability students, and d) high-ability students randomly assigned to residence halls. Grades and withdrawal rates of these four groups of students were compared in each of two academic years.

During the first year, with a 25% concentration of high-ability students, differences in grades among the four groups, with aptitude held constant, were negligible. During the second year, with a 50% concentration of high-ability students, the high-ability students living in close proximity to one another had better grades, with aptitude held constant, than did those high-ability students randomly assigned. Average students living near high-ability students had lower grades than did average students randomly assigned. Dropout rates were similar for both high-ability groups both years, but in both years the average students living with high-ability students had higher withdrawal rates than did the other average students.

Recent studies had suggested that research reporting no effects of counseling had obtained the negative results because the researchers indiscriminately lumped together psychotherapy involving high therapeutic conditions and psychotherapy involving low levels of empathy, warmth, and genuineness on the part of the therapist. Therefore, *Dickenson and Truax* (1966) attempted to test the hypothesis that those students in academic counseling receiving the highest levels of therapeutic conditions would show the greatest improvement in GPA or level of underachievement.

Out of 109 underachieving students, 48 responded to a form letter indicating the availability of group counseling. These 48 students were then split in half to from a "therapy" and a "control" group that were matched on average age, average predicted GPA, average precounseling actual GPA, average course load for the first semester, and average course load for the second semester. The therapy group was split into three separate treatment groups of eight students each. The sessions for the three treatment groups were tape recorded and later judged on therapeutic conditions using the Accurate Empathy Scale, the Unconditional Positive Regard Scale, and the Therapist Genuineness Scale.

Analyses using *t* tests revealed that the total group of therapy students exhibited significantly greater GPA improvement than did the control group. When comparisons were made within the therapy groups, both of the two sections having higher therapeutic conditions had significantly greater GPA improvement than did the group having lower (moderate) therapeutic conditions. In fact, the treatment group with only moderate therapeutic conditions did not differ from the control group on the improvement output measures.

For students entering courses in the College of Basic Studies at the University of South Florida, *Hartnett and Stewart* (1966) compared the achievement of students taking the courses on a regular basis to those taking the same courses by independent study. Independent-study students must receive special permission to take the courses in this manner, and they must have demonstrated superior ability. For each course, a group of regular students was formed which was matched to the independent study students on general academic aptitude (using scores on the Florida Twelfth Grade Test Battery). Grades on the final examination for each course served as the criterion for the study. Using analysis of variance procedures, performance on this criterion was compared for the matched groups.

For all six courses, those taking the course on an independent study basis had higher mean performance on the final examination than did those taking the course on a regular basis, and for two of the courses (Fundamental Mathematics and American Ideas) the difference was large enough to be statistically significant ($P < .05$). These findings suggested that the routine procedure of attending clasess, taking notes, and writing tests may not be the most meaningful process of learning, at least for some students.

Hill and Grieneeks (1966) wanted to know if academic counseling could improve the grades of underachievers and keep the grades of overachievers from decreasing (as would be expected because of regression effects). For 1,587 entering freshman males and 1,277 entering freshman females at the University of Texas, predicted GPA's based on ability test scores and high school grades were computed. At the end of the year, all students who achieved one or more standard deviations above their predicted grades were designated as overachievers, while those achieving one or more standard deviations below their predicted grades were designated as underachievers. Using university records, those who had received academic counseling during the second semester were identified.

Each counseled student was matched with three independently chosen control students on the basis of sex, high school grades, and the verbal and mathematics part of the University of Texas Admissions Test. The non-counseled control groups consisted of underachievers, overachievers, and par-achievers. For each counselee and control student, the difference between the first and second semester GPA was calculated. The mean GPA gains for second-semester counseled overachievers and counseled underachievers were compared with the gain for each of the control groups, separately using *t* tests. Both male and female underachieving counselees improved no more than matched under achieving controls, although they did gain more on GPA than the other controls. Further analysis revealed, however, the greater gain for underachievers over par- and overachievers could be attributed to a greater regression effect rather than to a beneficial effect of counseling. It was concluded that if academic counseling is positively affecting performance, it is not being reflected when the criterion measure chosen is GPA.

Tuola, Winburne, and Whitmore (1968) attempted to describe and to evaluate a computer-assisted program in academic advising for students on probation. The sample included 142 Michigan State University students. The program was developed for an IBM1401 computer, which reproduced the students' current enrollment, previous terms' enrollment, summary-of-grades data, and projected grades necessary to bring the cumulative average up to the 2.0 considered average at that school. This listing was produced within three days after the start of the term and enabled the student affairs office to advise changes in schedules after "suspect enrollments" were detected and confirmed.

Students whose enrollments appeared to be "unreasonable" were contacted by the student affairs office and enrollment changes were suggested, assuming that the student and the counselor could agree that it was desirable. This resulted in a significant increase in GPA mean for the next quarter over the GPA increase for those who requested but who did not come in for the counseling. The study illustrates how the computer can aid students who are in need of specific individual contact and also how it can provide the data to make individual interviews more productive.

Menne et al. (1969) attempted to assess the effectiveness of direct teaching by tape recorded lecture. For a course in introductory psychology, the lectures of one professor were recorded during regular classroom sessions and as were notes taken on the blackboard material used during the presentation of his lectures. Later the tapes were edited (purely topical references were cut out) and the notes on blackboard material put into a booklet form. The next fall students who signed up for this section of the course (taught by the same professor in the same way) were allowed to choose between taking the course by traditional lecture or by tape lecture. A total of 149 chose tape lecture (experimental group) and 211 chose the live lecture (control group).

By the end of the fall quarter, 35 control students had dropped the course compared to only two experimental students. When group differences on regular course exams, total class points, and final course grade were analyzed through analysis of covariance (which controlled for differences on high school rank, American College Test Composite scores, and Minnesota Scholastic Aptitude Test scores), none of the criterion group differences were significant. Two follow-up replications yielded the same results, except that for the second replication, experimental-group students scored significantly higher ($P < .05$) than did the control students on the second exam in the course. The experimental students' reaction to using the taped lectures was generally favorable, with 70% saying they would recommend such taped lectures to other students. Since these were all volunteers, no definite conclusions can be arrived at; but it would seem that taped lecture can be as effective as the traditional lecture in supplying information to undergraduate college students.

O'Leary (1969) investigated the hypothesis that the amount of verbal activity by the academic counselor in a counseling situation is positively related to scholastic improvement. The subjects for the study were selected from the University of Illinois James Scholars, a group of high-ability freshmen. In an attempt to reduce the number of students who dropped out of the James Scholar Program, these students were asked to attend a total of four interviews between mid-term and the end of the first semester. Eleven of the counseled students who improved on GPA and viewed counseling positively constituted an "improved" group. The "nonimproved" group viewed counseling as being of little value, and their GPA improved little if any.

The tape recordings of the counseling interviews for the eleven students in each group were edited to include only counselor remarks and responses, and these were rated on amount of counselor activity by two undergraduate students (who did not know to which group the recording belonged) using a 20-variable checklist. As hypothesized, the counselors of the improved group more frequently expressed their opinions, more often suggested a plan of action, were more expressive and concrete, talked more per minute, had interviewed with more total lines of talk, and less frequently asked the students to express their opinions.

Pappas (1967) attempted to evaluate systematically the differential effects of three approaches to college orientation on the academic achievement of beginning freshmen. The sample included 170 freshmen from Kent State University. The sample was divided into high- and low-ability levels (on ACT Composite scores) which were in turn divided into three groups based on particular approach to orientation. The three orientation groupings were as follows: (a) pre-college only, (b) directive-factual, (c) small group. Students in the first group had experienced only the regular pre-college orientation provided by the university. In addition to the regular pre-college experience, students in the second group attended two additional one-hour orientation meetings where information was disseminated and verbal encouragement given, once during the first full week of the quarter and once during the sixth week. On the other hand, students in the third group attended a series of eight one-hour orientation sessions throughout the quarter, part of each session being spent in a structured lecture approach and part in a student-centered discussion approach.

Analysis of variance, by ability level and by orientation approach, indicated significant GPA mean differences among approaches at both ability levels. No interaction was found between demonstrated level of ability and type of orientation experienced in terms of academic achievement. Follow-up *t* tests revealed that the directive and small group approach students were similar on GPA means and that both had higher GPA means than did the pre-college group.

Richardson and *Johnson* (1966) compared the grade patterns over eight semesters of counseled and noncounseled students. All students in the study graduated from the undergraduate School of Business at the City College of the City University of New York. The 36 students who had participated in ten or more interviews of counseling were matched to a like number of students who had never applied for counseling on the following four variables: age, sex, high school average, and Scholastic Aptitude Test Composite Score. The noncounseled students reported on a questionnaire that they had never received counseling during their college career. The counseled group had a first-semester GPA mean of 2.34 compared with 2.23 for the noncounseled group, which is not what one might expect.

Analysis of variance applied to the grade patterns revealed that GPA increased significantly for both groups over the eight semesters. The final semester GPA mean for the counseled and noncounseled groups was 2.74 and 2.75, respectively. Analysis of variance also indicated that there was a reduction in grade variability for both groups over the eight semesters. Interestingly, only seven members of the counseled group were majoring in accounting while 21 in the noncounseled group (over half) were majoring in accounting. The groups probably should have also been matched on major.

Smith and *Walsh* (1968) attempted to determine the effect of various institutional contacts on academic performance of identified underachievers. The sample included 487 male freshman underachievers at Ohio State University. They were male dorm residents whose first quarter grades were more than one standard error of estimate below what it had been predicted using ACT scores and high school ranks as predictors.

These underachieving students were split randomly into six groups for contact purposes: Group 1 received a letter from the office of the Dean of Men; Group 2 received letters from five college offices; Group 3 had a brief verbal session with their floor counselor in the dorm; Group 4 had a brief session with the residence hall director; Group 5 received no contact whatsoever; and Group 6 received letters from the college office, e.g., college of arts and science.

When analyses of variance procedures were used to examine mean differences, it was found that no one contact was significantly more effective than another. There was a significant difference between first and second term grades, however, which suggested that a single brief expression of concern on the part of the college can have an effect on academic performance. Follow-up analysis using the Newman-Keuls technique revealed that four of the six contact groups had significant differences ($P < .05$) between first term and second term GPA, the exceptions being for groups 3 and 5.

Spielberger and *Weitz* (1964) evaluated a group-counseling program for improving the academic performance of anxious college freshmen. The investigation was carried out with two successive classes of male liberal arts freshmen at Duke University (1959 and 1960). All entering students took a modified form of the Minnesota Multiphasic Personality Inventory (MMPI), the Taylor Manifest Anxiety Scale (used to identify anxious students), the American Council on Education Psychological Examination (ACE), and the Scholastic Aptitude Test (SAT).

All anxious students who scored high on SAT were invited to participate in an "Academic Orientation Project" (AOP). Of the 112 students invited to participate in the 1959 AOP, 56 volunteered. In 1960, 75 of 122 invited freshmen volunteered. The AOP volunteers were split into an experimental group (counseled) and a control group (uncounseled), with the two groups carefully matched on ACE aptitude, type of high school attended, and declared curricular major. The experimental group students were assigned to one of four counseling groups which met each week of the first semester. The control group students were invited to participate in counseling groups during the second semester along with the experimental group members who wished to continue.

The criteria for the study included first-semester GPA, second-semester GPA, and academic failure prior to the junior year. Analysis of variance (for the GPA criterion) was the statistical procedure used in the evaluation. It was discovered that students who regularly attended the first-semester counseling groups made higher grades than did experimental-group students who did not attend regularly and control-group students. The effects of counseling during the second semester were obscured by fraternity affiliation effects on grades. Concerning failures, although after two years a higher percentage of "high attenders" were academic persisters, the differences between groups were not statistically significant.

Thoresen (1967) reported on an exploratory program which was initiated at Stanford University to identify and to assist one disadvantaged student to enter and succeed in his first year of junior college. The fact that the sample included only one student makes this study unique. A male Negro high school senior considered especially inadequate for college work (as indicated by high school counselor and teacher remarks and by a structured interview with the student) was invited to come to enroll in college and to participate in a special program designed to explore methods of helping disadvantaged students to succeed in college. He was told that the project would involve considerable work and effort on his part.

As part of the program he received the following: (a) Weekly individual behavioral counseling sessions where certain behaviors were verbally and nonverbally reinforced and where appropriate behaviors were modeled by the counselor or his peers on tape. (b) Weekly individual tutorial sessions in reading and writing skills. (c) Part-time employment as an assistant in a laboratory where he often interacted with graduate students and professors. (d) Monthly payment of one dollar per hour for attending class, taking notes, and listening carefully. (e) Additional monthly financial payments for any grades of "B" or "A" earned for the month. (Monthly reports on his grades for that month were received from his instructors, so they were in on the experiment, which may or may not have affected their monthly evaluations of his work).

For the first year of junior college, the student earned a "low B" overall GPA. He remained in college while all of his disadvantaged Negro peers who started college at the same time dropped out. More importantly, his attitudes about himself as a person and about his future changed markedly for the better. While the monetary reward had initially been very important to him, after the first semester he stated that he no longer felt that he needed to be paid.

Zunker and *Brown* (1966) explored the comparative effectiveness of student and professional counselors. A random sample of 160 beginning freshmen at Southwest Texas State College, half males and half females, received six and one-half hours of academic adjustment guidance from same-sex professional counselors. Upperclassman student counselors gave equivalent guidance to all other beginning freshmen at the college. A matching sample of 80 men and 80 women was subsequently drawn from the 316 freshmen receiving student-to-student counseling. Age, sex, scholastic ability as measured by the American College Tests, study orientation as measured by the Brown-Holtzman Survey of Study Habits and Attitudes, and HSA were employed as the matching variables. The four professional and eight student counselors completed 50 clock hours of identical precounseling training, used identical guidance materials, and followed identical counseling activity sequences. Equivalent counseling facilities were provided for all counselors.

Employed to evaluate the comparative effectiveness and acceptability of counseling given the professional-counseled and the student-counseled groups were t tests. Student counselors were found to be as effective as professional counselors on all criteria of counseling effectiveness. Furthermore, freshmen counseled by student counselors made significantly greater use of the information received during counseling, as reflected by first-semester grades and residual study problems. It was concluded that carefully selected, trained, and supervised student counselors provide a practical and productive addition to the college's guidance program.

Counseling and Special Programs as Correlates of Grades, Persistence, and Academic Learning: Bibliography of Published Literature

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UNIQUE AND MISCELLANEOUS CORRELATES OF ACADEMIC ACHIEVEMENT

A number of variables were examined by only one or a few studies. Such studies are included in this chapter. Some of these studies were especially innovative and should prove quite stimulating to the reader. Other studies were merely of variables in which little research interest was evident. In some cases, the miscellaneous variables were studied only as an aside, and the research focus was on other variables.

One of the variables included in this chapter was explored in every other predictor category of this monograph. This variable was sex, which should be controlled in any good study. There were a couple of studies that looked exclusively at sex, however, and those studies were included in this chapter.

Unique and Miscellaneous Factors as Correlates of Grades, Persistence, and Academic Learning: Selected Annotations

Aller (1963) explored the marital adjustment and academic achievement of married college students. One hundred couples married less than 11 years, and for which at least one of the spouses was enrolled at the University of Idaho, constituted the sample for the study. The sample consisted of 46 couples where both spouses were enrolled, 47 in which only the husband was enrolled, and 7 in which only the wife was enrolled. Data were gathered through use of the California Psychological Inventory; the Locke and Wallace Marital Adjustment Test; and a questionnaire soliciting information on background, problems, and advice to students considering marriage.

GPAs for the student husbands and wives were higher than the averages for the total population of men and women at the university. Within the married group, student parents earned slightly higher grades than the nonparents and student wives earned higher GPAs than did the husbands. The correlation between marital adjustment and GPA was —.249; not quite significant at the .05 level. This tendency for higher GPAs to be associated with poorer marital adjustment in wives may indicate that scholastic excellence on their part is costly when it comes to the marital relationship. On the other hand, it may merely indicate that unhappy, insecure wives have sought compensation in the academic "arena." At the graduate level, student husbands perceived themselves as enjoying better marital adjustment when their wives were also students. Other findings were that financial problems and other areas of difficulty adversely affected marital adjustment, that student parents felt guilty about the lack of time for their families, and that self-control and responsibility correlated significantly and positively with marital adjustment.

Benson (1967) used the Samuelson's marginal utility theory of economics in an attempt to improve GPA prediction for college students. Seventy-six college subjects reported in a matrix table how they would divide their time for each of 21 pairs of activities if they had seven hours per week and, secondly, if they had 21 hours per week for such activities. Seven different activities were paired with each other into as many pair-combinations as possible. The seven activities were study on your own, sports participation, watch entertainment, leisure-time reading, recreation with others, altruistic activities, and religious activities. Instead of single measures of degree of interest as in regular inventories, the marginal utility inventory provides profile lines showing how apparent desire for an activity changes with the expenditure of added amounts of time. If the profile line has a high intercept and a small slope, this indicates strong and sustained interest. A low intercept indicates little interest and a steep slope indicates a rapid decline in interest.

Bradley (1967) studied performance factors for 583 regularly enrolled Negro students who had completed at least six hours of credit at the seven predominantly white state colleges and universities in Tennessee. Data for the study were gathered from high school and college student records, from interviews with the college deans of student affairs, from a questionnaire mailed to the students, and from a questionnaire mailed to faculty members identified by the students.

One small part of the study dealt with the prediction of GPA using multiple-regression analysis. After chi-square analysis had eliminated seven nonintellective variables from further consideration and factor analysis had revealed three factors (acceptance factor, confidence and ability factor, morale factor) in the responses to a 12-item checklist in the student questionnaire, ten predictor variables were included in the regression equation: scores on the four American College Tests (ACT), the three factors derived from the student checklist, education of father, education of mother, and high school grade average (HSA). Four of the factors made significant contributions to the prediction of GPA ($P < .05$): HSA, the confidence and ability factor, ACT Social Studies, and the morale factor. The multiple correlation with GPA obtained was .61.

A couple of the conclusions from the study related to the prediction of GPA.

One was that ACT scores should not be used in the same way for predicting the academic success of the Negro students as they are for the more privileged white students. Separate prediction equations should be used for the two groups. The second conclusion was that most Negroes will continue to experience academic difficulties in interracial colleges until they have an opportunity to experience interracial education at the elementary and secondary school level.

Cropley and Field (1969) administered a battery of tests to 178 science students in two high schools in New South Wales, Australia. There were 104 boys and 74 girls ranging in age from 15 years 8 months to 18 years 7 months. The tests included a standardized test of science achievement, a measure of intelligence, and four tests involving intellectual style: originality, flexibility, category width, and a test of the abstractness of intellectual functioning.

The distribution for each style variable was split into high, middle, and low categories and analysis of covariance utilized for sex and intellectual style on achievement data, with intelligence held constant. Relationships among style, achievement, and sex were significant for three style variables out of the four. The fact that science achievement was related to abstract thinking, originality, and category width for these students supports the hypothesis that "intellectual style" is important for academic achievement. It should also be noted that large sex differences were obtained.

Kramer and Kramer (1968) compared grade-point averages and library loan records of 742 freshmen (a 50% sample) at California State Polytechnic College. Chi-square analysis results indicated that library users (those checking out at least one book during the quarter) tended to have a higher GPA than did nonusers, a GPA mean of 2.22 for users versus a GPA mean of 2.00 for nonusers. Library use and grades were more closely associated with persons majoring in arts and agriculture while they tended to have little relation to grades for students in engineering and science. A total of 74% of the library users returned the following year while only 57% of the nonusers returned the next year.

Lindeman, Gordon and Gordon (1969) attempted to discover the relationship between inner desire to achieve and uric-acid level in the blood, plus the relationship between external environmental pressure and cholesterol level. The sample included 75 men and 135 women at Wagner College, 31 men and 47 women from the University of Stockholm, and 138 University of Florida football players. Technician Autoanalyzers were used to measure academic performance. Scholastic Aptitude Test scores were used for the Wagner College students and high school GPA for the Swedish students as measures of academic ability. Pencil and paper attitude tests were also given to all participants in the study.

Positive relationships were found between inner desire to achieve and level of uric acid in the blood. A positive relationship was also found between cholesterol level and external environmental pressure. In addition, the results indicated a significant correlation between the level of uric acid in the blood and GPA for Wagner College students, but not for the college students in Sweden, where admission is more selective and academic pressure less.

Paraskevopoulos and Robinson (1969) investigated whether veterans achieve higher first semester GPAs than did nonveterans when they were matched on precollege measures of academic potential. The sample included 87 veterans and 1,113 nonveterans matched on American College Test (ACT) Composite score and high school rank. The veteran group was older than the non-veteran group (no attempt was made to also match the two groups on age), with a mean chronological age of 22 years and 4 months. The veterans achieved a higher GPA mean (3.02 compared with 2.76), suggesting that their academic potential is underestimated by ACT Composite scores and high school percentile rank.

Paraskevopoulos and Thompson (1968) conducted a survey on foreign students. The sample included 1,600 foreign students at the University of Illinois. The ratio of foreign to American students was one to 28 on the Champaign-Urbana campus.

Typical admission tests used in the United States were found to have limited predictive value for foreign students. Much of the failure of these tests was traced to the low level of English proficiency among foreign students. The admission tests were of greater predictive value for students with a strong knowledge of English.

Questionnaire replies from more than 500 faculty members at the University indicated that faculty members in the physical and biological sciences used identical grading standards for American and foreign students. Some moderate grade adjustments were sometimes made by faculty in the social and behavioral sciences for students coming from non-English speaking countries.

Reyes and Clarke (1968) conducted two studies, one with high school students and one with college students, to determine whether individual differences in intra-individual consistency are reliable over time, and whether future grades can be predicted more accurately for students whose grades do not vary much from course to course than for students with "spotty" academic records.

The sample for the high school study included 170 males and 173 females graduating from a high school in Palo Alto, California. The measures of intra-individual consistency were computed from five course areas (math, science, English, social studies, and foreign language), grades in the initial year in high school that the course was taken, and grades in the final year that the course was taken. Correlations between initial and final GPAs indicated no difference between the two groups on how well initial GPA could predict final GPA.

The college study included four groups of students at San Jose State College. Once again comparisons between earliest grades and final grades in particular course areas were made. And once again the measures showed no change over time, and there were no differences with regard to accuracy of prediction of future grades.

Stecker and Voigt (1968) hypothesized that scores on the Most Vivid Memory Technique (MVMT) would be significantly related to student's GPA. The MVMT elicits the strongest recollection in a particular class of memories, i.e., describe your greatest success, describe your greatest failure, describe your greatest success in school, and describe your greatest failure in school.

The sample for the study included 67 general psychology students. Instruments used included College Achievement Scale (CAS), MVMT, and Scholastic Aptitude Test (SAT). Partial correlation coefficients were computed to evaluate the relationship between GPA and MVMT and the relationship between GPA and CAS, with SAT held constant in both instances. The correlation between GPA and MVMT (.29) was significant beyond the .05 level of significance. The correlation between GPA and CAS (—.19) was not significant. It was concluded that the MVMT can probably be used as a nonintellective predictor of academic success, since its validation included controls for intelligence and it was validated on a broadly based sample. The authors suggested that cross-validation is necessary and that it might be a good idea to include the MVMT in multiple-regression equations with intellective predictors.

Wagman (1968) hypothesized that there would be an inverse association in college students between academic achievement level (GPA) and frequency of daydreaming activity. This is derived from Freud's conception of daydreams as a response to frustration and from more recent formulations of the ego psychology which see daydreams as providing outlets for thoughts and impulses normally held in check in interpersonal relationships in order to permit the gratification of more appropriate or useful responses.

To test out the hypothesis, the author had undergraduate men (105) and women (101) at the University of Illinois respond to a daydreaming activity questionnaire which had subjects indicate on a 5-point scale how frequently they had experienced each of 120 common daydream scenes. It was concluded from the results of the study that the hypothesis was supported for women but not for men. For women, statistically significant negative correlations were found between GPA and each of the following types of daydreams: guilt or superego, outward aggression, death, passivity, pregenital orality, pregenital narcissism, physical attractiveness, sexual activities, achievement, self-aggrandizement, parents and family, money and possessions, improbable, pleasant, and total.

Wyer (1968) hypothesized that willingness to cooperate with others in achievement-related activity may often lead to more effective goal seeking and that if manifested in academic areas (e.g., through informal discussions, using and receiving assistance in problem solving, etc.), it may increase academic effectiveness. The sample included freshmen at a large midwestern university. Four groups of students (16 men and 16 women in each group) were selected to represent four combinations of academic aptitude and performance based on college entrance exam (ACT) scores and first-term grades. They were each paid $1 for their services and were placed in 2-person groups to do a decision-making task in which their choices would either increase individual attainment at the expense of a group goal or increase group goal attainment at the sacrifice of individual goal attainment.

Lindquist Type III analysis of variance procedures were performed on the number of team-oriented responses as a function of sex, aptitude, performance, and type of matrix. There were significant main effects for performance and matrix and significant interaction effects for sex, performance, and matrix ($P < .05$). These results indicated that there was a general tendency to increase frequency of group choices when group goals were greatly affected. Where choices had little effect on attainment of group goals, frequency of group choices was not related to academic performance of males and females. When these decisions had a relatively large effect on group goals, this positive relationship held only for students of high academic aptitude.

Unique and Miscellaneous Factors as Correlates of Grades, Persistence, and Academic Learning: Published Literature

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